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ABSTRACT

Legal Determinants of the Return on Equity*

Recent work documents that better legal institutions are associated with broader equity markets. We investigate whether international differences in legal institutions also help explain the international cross-section of expected stock returns. We document three main regularities. First, total stock market returns are positively correlated with overall measures of the quality of institutions, such as judicial efficiency and rule of law, but have no relationship with measures of shareholder rights, controlling for risk. Second, dividend yields and earning-price ratios also correlate positively with judicial efficiency and rule of law, but negatively with shareholder rights' protection, controlling for risk and expected earnings growth. Thirdly, the excess return on new issues is negatively associated with the quality of accounting standards. We interpret the positive effect of the overall quality of institutions on equity returns as capturing the resulting curtailment of private benefits and increase of profitability, under imperfect international integration of stock markets. The negative impact of shareholders' legal protection and of accounting standards can instead be seen as resulting from the implied reduction in shareholders' auditing and monitoring costs.

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NON-TECHNICAL SUMMARY

Recent empirical evidence has shown that the degree of respect for the law, the efficiency of the judicial system in enforcing contracts and the legal and judiciary protection of investors' property rights vary substantially across countries belonging to different legal families. In their widely cited work, La Porta, Lopez de Silanes, Shleifer and Vishny (LLSV) have documented that institutions in Common Law countries provide minority shareholders with a much stronger protection from managerial opportunism than they do in Civil Law countries. Legal and judiciary systems in German Law countries, on the other hand, make it particularly difficult for debtors to violate creditors' property rights. LLSV have shown that these differences are significantly related to cross-country differences in the amount of debt and external equity issued by firms. In particular, firms use more external equity finance in countries where minority shareholders' rights are better protected by the law and by the judiciary. Their interpretation of this finding is that agency problems are less severe when the legal protection of minority shareholders is strong and its judicial enforcement is swift and cost-effective.

This Paper investigates empirically whether taking these institutional differences into account allows also a better understanding of the international cross-section of expected rates of return on equity.

If institutions can affect the severity of agency problems, then institutional differences in the legal and judicial protection of minority shareholders can translate in systematic international differences in the equilibrium rate of return on equity. Agency problems between company insiders and outside shareholders affect the equilibrium on the equity market in at least two ways.

First, they affect the return on equity that firms can pay, because the marginal productivity of physical investment cannot be pledged entirely to investors, due to the expected amount of managerial diversion. Second, if shareholders expect to incur auditing and judicial costs in order to secure payment of dividends by managers, they will require to be compensated with a higher return for any given amount of risk. For brevity, we refer to the first effect of better legal institutions as a 'reduction of private benefits' and to the second as a 'reduction in auditing costs'.

Thirdly, greater respect for the law and better law enforcement may benefit companies by expanding the set of contracts with suppliers and customers that can be enforced in court. Equivalently, they can reduce the cost of enforcing these contracts. *Ex ante*, this makes a wider menu of economic transactions available to each company and this should increase its profitability. This effect differs from the previous two because it does not hinge

on the existence of agency problems between the company and its financiers. We refer to it as a ‘pure profitability effect’.

The magnitudes (and the signs) of the effects of better institutions on the rate of return on equity also depend in an important way on the degree of international integration of equity markets.

In a perfectly integrated stock market, the supply schedule is flat: the risk-adjusted rate of return in the absence of agency problems is the world risk-free rate. With agency costs, equilibrium risk-adjusted returns differ only if shareholders incur different auditing and legal costs when investing in different countries. Investors who expect to pay high fees to accountants and lawyers to supervise managerial conduct and enforce their claims will require to be compensated accordingly. Therefore, the prediction is that a more investor-friendly environment should be associated with lower risk-adjusted returns on equity.

When markets are not perfectly integrated, however, the supply of equity capital to firms in any given country is upward sloping. Hence, better institutions may result in higher returns on equity if their main effect works through either a reduction of managerial diversion or an increase in the firms’ pure profitability.

To test these predictions of the theory, we use several measures of the return on equity. For a public company, one natural candidate is the return on its shares. This must be corrected for undiversifiable risk (and for diversifiable risk if equity markets are internationally segmented). Other widely used measures are the earnings-price ratio and the dividend yield. These accounting measures must be purged of the component reflecting cross-country differentials in expected earnings growth. For a private company seeking its first listing, instead, a more relevant measure may be the excess return of its shares in initial public offerings (IPOs).

We document a rich set of empirical regularities. Of these, the most robust finding is that the risk-adjusted return on equity is positively associated with the respect for the law and with judicial efficiency. This suggests two conclusions. First, consistently with much research in international asset pricing, international equity markets are far from being fully integrated. We find that the relationship between equity returns and general measures of the quality of institutions is strong and positive (and, by implication, the degree of international segmentation is high) even when one restricts the analysis to the sub-sample of developed markets. Second, on balance, greater respect for the law and a more efficient judiciary shift out the demand for equity capital (both gross and net of managerial diversion) more than they shift out the supply of equity.

When we use accounting measures of the rate of return on equity, this basic finding is confirmed. In addition, using these measures, we find that legal provisions specifically aimed at protecting minority shareholders reduce the expected return on equity, for given level of the respect for the law and judicial efficiency. This is consistent with the idea that investors are more willing to provide funds to firms in jurisdictions where they are better guaranteed from managerial opportunistic behaviour.

Finally, we document that IPO underpricing is negatively correlated with the quality of accounting standards. This accords well with theories of IPO underpricing that emphasize informational asymmetries between the generality of investors (the ‘uninformed’ bidders) and the ‘smart money’ in the market for new issues. If shares initially quote at a discount because uninformed investors must be compensated for their expected losses to better informed ones, then the IPO discount is likely to be greater where accounting practices are lax and opaque and, as a result, informational asymmetries are more important.

1 Introduction

Understanding the determinants of the international cross-section of stock returns has proved a daunting task for research to date. The explanatory power of the International Capital Asset Pricing Model (ICAPM) is typically found to be quite low (see, among others, Solnik, 1977, Ferson and Harvey, 1994 and Bekaert and Harvey, 1995). In this paper we claim that a better understanding of this subject can be achieved by combining the traditional asset pricing approach with the law and finance approach.

So far, these two strands of the literature have been totally disjoint. However, the recent cross-country study by La Porta, Lopez de Silanes, Shleifer and Vishny (1997, henceforth LLSV) shows that external equity financing correlates with differences in legal rules and in their enforcement. More specifically, the share of stock market capitalization held by minorities and the number of initial public offerings correlate positively with the degree of respect for the law, the quality of judicial enforcement and the legal protection of minority shareholders. Their interpretation of this finding is that opportunistic behavior by managers and controlling shareholders at the expenses of investors is less likely when the legal protection of the latter is strong and its judicial enforcement is swift and cost-effective.

An obvious question then arises. Do these institutional differences translate also into differences in the expected rates of return across countries? At a theoretical level, the answer to this question depends on a number of circumstances.

A finance textbook approach would predict no effects. With fully integrated markets and no agency costs of external finance, expected stock returns should depend only on covariance risk with the world market portfolio, and institutional differences should have no explanatory power. The agency problems due to the separation between ownership and control change the picture considerably, creating a role for international differences in legal rules and their enforcement.

The legal environment can affect the severity of agency problems between company insiders and outside shareholders in two ways. First, it may directly affect the private benefits that managers are able to extract from companies. Second, it determines the auditing and judicial costs that shareholders must incur in order to secure payment of dividends by managers. International differences along these two dimensions of the legal environment have different effects on equilibrium stock returns, depending on the degree of international

integration of stock markets. The latter in fact determines the sensitivity of the rate of return on equity required by investors to the total amount of resources demanded by companies.

In a perfectly integrated stock market, equilibrium risk-adjusted returns may differ only if shareholders incur different auditing and legal costs when they invest in different countries. Investors who expect to pay high fees to accountants and lawyers to supervise managerial conduct and enforce their claims will require to be compensated accordingly. Therefore, the prediction is that a more investor-friendly environment should be associated with lower risk-adjusted returns on equity. The diversion of corporate resources by managers, in contrast, does not per se impose extra costs on external shareholders: equity prices will discount the private benefits to be extracted by managers, so as to equalize the expected risk-adjusted rate of return across countries.

In an internationally segmented equity market, however, also the amount of private benefits matters for equilibrium stock returns. Since the risk-bearing capacity of domestic investors is limited, higher amounts of equity funding come forth only if companies are willing to pay a higher expected rate of return. Stricter legal limits to managerial opportunism allow companies to credibly pledge higher returns and thereby obtain a larger amount of equity funding. In this case, therefore, countries with lower levels of private benefits of control will feature higher risk-adjusted rates of return, in equilibrium.

To summarize, in the benchmark case of full international integration and no agency costs, legal variables should not matter for risk-adjusted stock returns. With agency costs and international integration, the effect of better institutions on returns is either zero or negative. With agency costs and segmented markets, their effect on stock returns can be either negative or positive, depending on whether they reduce the costs directly borne by investors or the private benefits of company insiders.

In this paper, we bring these predictions to the data. Estimating the impact of legal factors on stock returns is not only of interest for research in international asset pricing, but also contributes to the interpretation of the results reported by LLSV (1997). Our approach is also immune from a potential problem present in their estimates. Their approach disregards that resort to external finance in different countries may reflect the capital intensity of the local companies, a point forcefully made by Rajan and Zingales (1998).[1] In contrast to the amount

[1] A power station typically needs more external funding than a shoe factory, other things being equal. If, say, more industrialized countries have a more capital-intensive industry mix and better judicial enforcement

of external equity, the risk-adjusted rate of return on equity should not be affected by the industry mix of the relevant country.

In addition, our results are relevant for investors and policy makers alike. For example, fund managers and individual investors are interested in knowing if the international pattern of risk-adjusted returns warrants investing in countries with a poor legal environment and low corporate governance standards. In addition, insofar as our results shed light on the degree of international stock market integration, they have important implications for the political economy of legal reform. The degree of international integration determines who gains and who loses from legal reforms. For instance, if legal rules are unexpectedly changed so as to reduce private benefits, in a fully integrated economy the gains are entirely reflected in an increase of stock prices and therefore are reaped entirely by existing shareholders. In contrast, in an internationally segmented stock market, only a fraction of the benefits materializes in a stock price increase: the remainder translates into an increase of the expected rate of return, which accrues to future shareholders as well.

In our study, we face some well-known problems in measuring risk-adjusted expected returns on equity. The first is that expectations are not directly observable. Second, several measures of the return on equity can be used. For a public company, the return on its shares, the earnings-price ratio, and the dividend yield are all candidate measures, each with its own strengths and weaknesses. For a private company seeking its first listing, instead, a more relevant measure may be the excess return of its shares in initial public offerings (IPOs). Thirdly, measures such as the return on secondary markets must be corrected for undiversifiable risk (and for diversifiable risk if equity markets are internationally segmented), while others, such as the earnings-price ratio, must be purged of the component reflecting cross-country differentials in expected earnings growth.

We document a rich set of empirical regularities. Of these, the most robust finding is that the risk-adjusted return on equity is positively associated with the respect for the law and judicial efficiency. This result is consistent with the hypothesis of imperfect international integration of equity markets. When we measure the rate of return with accounting variables, we also find that legal provisions specifically aimed at protecting minority shareholders reduce the expected return on equity, for given level of the respect for the law and judicial

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(possibly as a reflection of their higher socio-economic development), the estimated correlation between external finance and judicial enforcement is at least partly spurious

efficiency. Finally, we document that IPO underpricing is negatively correlated with the quality of accounting standards.

Our paper contributes to a small but growing literature addressing the impact of institutions on the performance of financial markets. Beside the already-mentioned contribution by LLSV (1997), several other papers are worth mentioning. Modigliani and Perotti (1997) also highlight the relationship between the enforceability of contracts and the availability of external finance. Other papers are instead concerned with the effect of financial development on growth, in the footsteps of earlier work surveyed by Pagano (1994) and Levine (1997), and use legal variables mainly to instrument financial development measures in their growth regressions. Rajan and Zingales (1998) point out that firms and industries which are more dependent on external finance tend to grow faster in countries where financial markets are better developed, and test this prediction on a large panel of industry-level cross-country data. Carlin and Mayers (1998) build on the Rajan-Zingales approach to probe further into the relationships between industrial activity, financial systems and legal arrangements, and conclude that market-based finance and legal protection of investors are correlated with the growth of equity-financed and skill-intensive industries. Demirgüc-Kunt and Maksimovic (1998) test the same hypothesis on firm-level data from thirty countries. They estimate the maximum growth rate that each firm of their sample could attain without access to long-term financing, and compare these potential growth rates to those attained by firms in countries with different legal and financial systems. They show that in countries with better legal systems, more active stock markets and larger banking sectors, a greater fraction of firms funds growth by external long-term finance.

The structure of the paper is as follows. Section 2 presents a simple analytical framework to interpret the evidence. In section 3 we describe the data. In section 4 we report our results, which are based on different measures of the return on equity: secondary market returns, accounting measures, and excess returns on primary equity issues. Section 5 concludes.

2 A Simple Model

In this section we briefly illustrate the channels through which legal variables may affect the equilibrium rate of return on equity. The analysis, for brevity presented only graphically, is based on a simple model presented in Lombardo and Pagano (1999), and is meant as a tool to organize ideas and interpret the empirical findings presented in subsequent sections.

As mentioned in the introduction, the legal environment can affect the equilibrium rate of return on equity by tempering the agency problems between managers and shareholders. This can occur in two ways. First, better legal institutions may reduce the fraction of corporate resources that managers are able to divert. For instance, legal limits to managerial discretion concerning asset sales or merger agreements may curtail the scope for dilution of minority shareholders' income rights. Second, legal rules, accounting standards and courts' efficiency determine the auditing and judicial costs that shareholders incur to keep managers in line. For example, the availability of class action suits and the possibility of voting by mail reduces the cost of shareholder activism and increases its effectiveness.[2] For brevity, we shall refer to the first effect of better legal institutions as a "reduction of private benefits" and to the second as a "reduction in auditing costs".

In addition, better law enforcement may benefit companies by expanding the set of contracts with suppliers and customers that can be enforced in court. Equivalently it can reduce the cost of enforcing these contracts. Ex ante, this makes a wider menu of economic transactions available to each company, which should be expected to increase its profitability. This effect differs from the previous two ones because it does not hinge on the existence of agency problems between the company and its financiers. We refer to it as a "pure profitability effect".

The three effects are illustrated graphically in Figures 1 to 3, which refer to the case of imperfect international integration (the underlying model in Lombardo and Pagano, 1999, encompasses perfect international integration as a special case). In all three figures, the upward sloping line is the supply of equity funds to companies: the more closely integrated the country is in world capital markets, the lower is its slope. A perfectly integrated market features a flat (perfectly elastic) supply of equity. The rate of return that companies can generate for each possible level of equity funding is instead a downward sloping locus, owing to the decreasing marginal productivity of capital: we label it the profitability schedule. When managers can extract private benefits, however, companies cannot pledge their entire profits to compensate shareholders for their funds, but only a fraction of it. The rate of return after

[2] The managers' opportunistic behavior may also create another cost for shareholders: more volatile earnings than warranted by technology and demand conditions, and therefore additional risk. Then shareholders will require compensation for this additional risk, if they cannot easily diversify it away. In fact, they may be unable to diversify it away precisely by the agency problem: when the costs of keeping managers in line are large, only large shareholders are willing to incur them, since they internalize the benefits of monitoring sufficiently.

managerial diversion determines the (inverse) demand function for equity funds. The vertical distance between profitability and the demand function is the amount of private benefits per dollar invested.

The equilibrium rate of return is found at the intersection between the demand and the supply of equity funds. The cost of capital to the company (gross of private benefits) is read on the corresponding point on the profitability schedule and determines the real investment decisions of its management.

A reduction of private benefits reduces the wedge between the profitability schedule and the demand schedule. As illustrated in Figure 1, this increases both the equilibrium rate of return and the quantity of external equity, while it reduces the cost of capital to companies. The effect on the rate of return, however, is smaller the flatter is the supply schedule. In the limit, in a perfectly integrated stock market, the effect vanishes altogether (while that on the quantity is maximal).

Conversely, a reduction in the auditing costs shifts the supply curve down and to the right. As shown in Figure 2, this reduces the equilibrium rate of return, and increases the quantity of external finance. Again, the cost of capital to companies decreases. The directions of these effects are independent of the degree of equity integration: they persist even if the supply schedule is perfectly elastic.

Finally, if an improvement in the legal environment has a pure profitability effect, it will cause an outward shift of both the profitability and the demand schedules. As illustrated in Figure 3, this will increase both the observed rate of return and the amount of equity financing (the cost of equity capital may change in either direction). If the supply curve is flat, the increase in profitability does not result into an increase in the observed rate of return, as in the case of a private benefit reduction.

In summary, in an internationally integrated stock market, the effect of better institutions on the rate of return is either zero or negative. With segmented markets, their effect is predicted to be positive if they reduce private benefits or increase firm profitability, and negative if they lower the auditing costs for which investors need to be compensated. The effect on the equilibrium quantity is always positive, consistently with the evidence of LLSV (1997). However, this increase in the breadth of the equity market is not necessarily associated with a reduction in the agency costs of external finance, as shown in Figure 3.

3 Data

We are interested in capturing the empirical relationship between the legal protection of shareholders' rights and the return on equity. To this end, we use data from different sources. To measure the return on equity, we rely on three different types of data: total returns on national stock markets, accounting measures of the return on equity, and the excess return on primary equity issues as measured by IPO underpricing.

3.1 Returns on National Stock Markets

Our sample of national stock markets includes data for both developed markets from Morgan Stanley Capital International (MSCI) and emerging markets from the Emerging Market Database (EMDB), provided by the International Finance Corporation (IFC) of the World Bank.

We draw monthly equity indices for 21 developed countries from MSCI. For eighteen of these, the sample starts on December 1969. For the remaining three, it starts on December 1987 (see Table A1 for summary statistics about MSCI markets). All indices extend to December 1997. These indices are value-weighted and are calculated with dividend reinvestment. MSCI also provides a value-weighted World Index, which serves as the market portfolio for developed countries[3]. As far as emerging markets are concerned, the starting date of coverage by EMDB differs more significantly across markets (see Table A2 for summary statistics related to the emerging markets sub-sample). For all countries, the sample extends to December 1997. As for MSCI data, the indices are value-weighted and calculated with dividend reinvestment.[4]

All returns are expressed in US dollars and are calculated in excess of the yield on the US treasury bill that is closest to 30 days to maturity on the last trading day of the month. This latter yield is drawn from the CRSP government bond file (see Fama (1984) for the

[3] The MSCI indices are broadly representative of each country's market composition. Virtually all the stocks (99%) can be traded by non-nationals as well as by domestic investors. As noted by Harvey (1991), the returns computed on the basis of these indices are highly correlated with widely quoted country indices, such as the NYSE value-weighted return (calculated by the Center for Research in Security Prices (CRSP) at the University of Chicago) for the USA, or the Nikkei 255 index for Japan. For details on the methodology behind the MSCI indexes, see MSCI.

[4] For the IFC methodology, see IFC. The selection criteria of the components of the MSCI and the IFC national indices are similar, though not identical. Bekaert and Harvey (1995) describe the EMDB indexes and briefly compare the IFC and MSCI methodologies.

computation of holding period returns). This yield is available to us up to October 1996. As a consequence, our sample of total excess returns also ends in this date.

3.2 Accounting Measures of the Return on Capital

Data on valuation ratios (such as price-earning ratios, price-book value ratios and dividend yield) are available for the same countries from the respective above-mentioned sources on an annual basis. We also have data from the IBES global aggregates. The IBES database contains monthly valuation indices for selected (mainly developed) countries as well as survey estimates of the expected growth in earnings per share. In our estimations (see results in table 5 and 6) we use the price/earnings ratios and the dividend yields as dependent variables. The price/earnings series is defined (see Datastream International for details) as the "weighted average price/earnings ratio based on 12-month forward earnings" (IBES datatype: A12PE). The dividend yield is defined as "weighted dividend yield based on the indicated annual dividend" (IBES datatype: ADVYLD). Furthermore we obtain series on the yield on domestic 10-year government bonds (IBES datatype: AGBYLD) for a sample of 18 developed countries.

3.3 The Cost of Capital on the Primary Market

We use the IPO underpricing as a proxy of the total cost of capital for firms tapping the equity capital markets for the first time. For the IPO data, our source is a study by Loughran, Ritter and Rydqvist (1994), updated by Ritter (1998). These authors provide a collection of estimates of average "IPO underpricing" in 32 countries.

3.4 Institutional Variables

Here we rely on the data set constructed by La Porta *et al.* (1998a). For a sample of 49 (both developing and developed) countries, they provide data on variables that capture: (i) the legal protection of both creditors' and minority shareholders' property rights; (ii) the origin of the national legal system; (iii) indices of the efficiency of legal enforcement; (iv) estimates of the quality of accounting systems. While we refer the reader to La Porta *et al.* (1998a) for a complete description of this interesting database and of their sources, here we briefly describe the variables that we use in our regressions and their original sources.

The variable "Judicial Efficiency" is an assessment of the "efficiency and integrity of the

legal environment as it affects business, particularly foreign firms". It is produced by the country-risk rating agency Business International Corporation and is an average between 1980 and 1983, ranging from 0 to 10, with higher values associated with higher efficiency levels.

Other variables that we use were constructed by La Porta *et al.* (1998a). Among these, the index "Anti-Director Rights" captures the degree of legal protection from expropriation by the managers and controlling shareholders granted to minority shareholders. It ranges from 0 to 6, with higher scores representing more thorough legal protection of minority shareholders. The dummy variable "One Share/One Vote" equals one if in the country concerned ordinary shares are required to carry only one vote per share and 0 otherwise. The variables "French Origin", "German Origin", "Scandinavian Origin", and "English Origin" are meant to indicate the "family" to which the legal system of a given country belongs. These "legal origin" dummies may capture residual cross-country differences in investor protection on top of those specifically reflected in the "Anti-Director Rights" indicator.

Most other legal and institutional variables used here are produced by the country-risk rating agency International Country Risk (ICR). Each variable is measured as the average of the months of April and October of the corresponding ICR monthly index between 1982 and 1995, and ranges on a scale from 0 to 10 (in some cases, by re-scaling the original ICR indices). The variable "Rule of Law" is ICR's "evaluation of the legal and order tradition in the country", with lower scores for countries with weaker legal and order tradition. "Corruption" is an assessment of the degree of corruption in the government, with lower scores indicating higher corruption. The "Risk of Contract Repudiation by the Government" is an assessment of the "risk of a modification in a contract taking the form of a repudiation, postponement or scaling down" due to "budget cutbacks, indigenization pressure, a change in the government, or a change in government economic and social objectives". Lower scores for this variable indicate higher risk. The variable "Risk of Expropriation" reflects ICR's evaluation of the risk of "outright confiscation" or forced nationalization, with lower scores indicating higher risk. Since the year-by-year values of these ICR variables are available for most of our sample periods, all the estimates reported in the next section were also repeated using these yearly values instead of their averages. The results – not reported for brevity – are qualitatively unchanged relative to those reported below.

Finally, the variable "Quality of Accounting Standards" is drawn from International Accounting and Auditing Trends (Center for International Financial Analysis & Research,

Inc.), and measures the quality of companies' annual reports along 7 general dimensions (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). In our complete sample of developed and emerging markets, it ranges between 24 and 83, with a mean of 61 and a standard deviation of 13.5.

4 Results

In this section we report our estimation results, divided in three subsections, each devoted to one of three alternative measures of the return on equity. In each subsection we describe the empirical methodology of our tests. In subsection 4.1, we describe our findings on the relationship between legal protection of minority shareholders and the return on equity on secondary markets. The main problem we tackle in this case is the correction for risk. In subsection 4.2, we report our results on the relationship between the institutional variables and the different accounting measures of the return on equity, such as the dividend yield and the earnings-price ratios, controlling for the effect of cross-country differences in expected earnings growth. Finally, we check if legal and judicial variables also matter for the primary equity market by investigating their correlation with estimates of IPO underpricing in different countries provided in the literature.

4.1 The Secondary Market Return on Equity

A basic tenet of asset pricing theory is that the return on any asset can be decomposed in two parts: the return on a "risk-free" asset and the compensation for undiversifiable risk. The asset pricing models proposed in the literature differ as to the quantification of the undiversifiable risk. The Capital Asset Pricing Model (CAPM) expresses it as proportional to the market beta of the asset, the proportionality factor being the market price for risk.

In the presence of agency problems between managers and shareholders, the expected returns on equity may include a third component, as explained in Section 2. While this third component may be hard to detect in any given country – where all firms operate under the same jurisdiction – it should be easier to detect and quantify in a cross-section of countries, where one can exploit the wide international variation in legal and judicial institutions which affect the severity of these agency problems.[5] Our approach will explore if such variation in

[5] Even in the context of a single country, agency costs can differ systematically across companies featuring

the respect for the law, judicial enforcement, protection of minority shareholders, and accounting standards can account for some of the international differences in the return to equity, after controlling for risk.

Indeed, such a prediction would appear to be confirmed by a quick look at Figures 4 and 5. There, we plot the average excess returns (over the period 1987-1996, chosen to maximize the number of countries included) against "rule of law" (Figure 4) and the efficiency of the judicial system (Figure 5). In both cases, a negative *unconditional* correlation emerges from the data. However, this may simply be a reflection of the pattern of riskiness across countries: we need to purge our excess return measures of the risk premium, before we can conclude anything about the relationships we are interested in. A regression analysis is therefore required.

The basic econometric challenge in our approach is the measurement of the risk-adjusted rate of return on capital. This measurement depends crucially on the assumptions one is willing to make on the degree of integration of stock markets around the world as well as on the validity of the Purchasing Power Parity (PPP) hypothesis.

If capital markets are fully integrated internationally and PPP holds continuously, the CAPM predicts that the risk premium on each country's stock market (as measured by the excess return denominated in US dollars relative to the US risk-free rate) is proportional to that country's Beta with respect to a world market portfolio. In fact, under the PPP hypothesis, inflation differentials between countries are precisely offset by the depreciation of their bilateral exchange rate. If PPP were not to hold, then the real exchange rate risk of each country would be an additional risk factor priced on world stock markets. Adler and Dumas (1983), Harvey (1991) and Dumas and Solnik (1995), among others, show that for developed markets exchange rate risk is indeed priced. Therefore they recommend the use of a two-factor model, by adding to the traditional factor (the return on a portfolio of international stock market indices) the return on a portfolio of deposits in different currencies with weights reflecting the world trade structure.

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different levels of investment in intangible assets (such as R&D). This can conceivably induce cross-sectional differences in profitability and in the cost of equity capital. For example, ceteris paribus, investors may require a large rate of return from an upstart company with a large fraction of intangible assets, since the managers' ability to extract private benefits may be higher than in more mature companies. In the U.S., the literature has widely documented the role of firms' attributes like the ratio of market to book value or the quota of intangible assets over total value in the explanation of cross-sections of expected returns (see for example Fama and French (1993)). Some of the "anomalies" in this literature have been interpreted along the lines of agency theory.

Also the assumption of integrated capital markets may fail in practice. While there might be reasons to believe that international capital markets are increasingly integrated (owing to the removal of capital controls in developing countries and the technology-driven reduction of communication costs across borders), there is evidence that the process is gradual, not complete and not unidirectional. If equity markets are internationally segmented, a country's Beta does not (fully) capture the risk premium on its equity market, and in addition the real rate of return on the risk-free asset may differ across countries. In this case the idiosyncratic (country-specific) component of total risk should have explanatory power in the cross-section of expected returns. As mentioned in the introduction, the literature indeed shows that the "pure" international CAPM model typically has low explanatory power. Bekaert and Harvey (1995) attribute its failure to the segmentation of national markets. Harvey (1995) offers evidence on segmentation particularly for the emerging markets, by showing that the average return of these markets is positively correlated with the volatility of the market itself but not with its Beta relative to the world portfolio.

We try to take the possibility of international segmentation into account by including measures of country-specific residual risk among our regressors. We also estimate separately our regressions for the sub-samples of developed markets, on the assumption that (at least in relative terms) for emerging markets segmentation may be more of an issue.

We use two alternative methods to carry out our tests, which differ in the way we purge the cross-section of unconditional expected returns from their risk premia. The two methods are respectively in the footsteps of the time-honored multiple-steps procedures proposed by Lintner (as reproduced in Douglas (1968)) and Fama and MacBeth (1973).

The first method consists of (i) estimating for each country a time-series regression of its market's excess return on the excess return of the world market portfolio (and possibly other risk factors), and (ii) regressing cross-sectionally the unconditional averages of the N countries' excess returns (computed on the entire time interval) on the vector(s) of Betas estimated in step (i), on the sample estimates of country-specific residual risk and on the institutional variables reported by La Porta *et al.* (1998a).

The second method, sometimes called "cross-sectional regression (CSR) method", involves (i) estimating Betas on an initial sample of, say, 5 years of data, (ii) for each of the subsequent months, running cross-sectional regressions of excess realized returns on the estimated Betas, on estimates of residual risk and – in our case – on institutional variables, and finally (iii)

"time-averaging" the estimated coefficients (taking into account the relative precision of the estimates, as explained below). Under the assumption of normality of excess returns, these "averaged" coefficients, once divided by their standard deviations, are distributed as *t*-statistics, thus allowing simple *t*-tests for inference purposes.

4.1.1 Lintner Regressions: Developed Markets

In Table 1, we report the results of the first estimation procedure, for the sample of developed markets. The sample includes all countries that are present in the MSCI database from 1970, and extends to October 1996.[6] We estimate a first-stage regression of the monthly total excess returns on the excess return of the world market portfolio and on an exchange risk factor. The monthly excess return of the world market portfolio is the value-weighted average of the excess returns on all the markets in the MSCI and EMDB databases which are active in that month.[7] The exchange risk factor is the change in the log of the G-10 exchange rate index (obtained from the Federal Reserve System Web page). The G-10 exchange rate index is a trade-weighted average of the bilateral exchange rate between the US dollar and the 10 main trading economies (the G-7 countries, not including the US, plus the Netherlands, Belgium, Sweden and Switzerland). The change in the log of this index approximates the excess return on a trade-weighted portfolio of foreign-currency bonds, assuming that the trade weights are known and that a trade-weighted combination of foreign currency deposit rates in the 10 countries is close to the US bill rate.[8] A positive change in the G-10 index indicates a depreciation of the dollar.

This first-stage regression is used to obtain estimates for the beta and the real exchange rate risk sensitivity of each market. In column 1 of Table 1, we report our preferred specification of the international asset pricing model for developed markets. As expected, beta enters with a positive coefficient (the average market price for risk is .009 on a monthly basis). Exchange risk enters with a negative sign, as expected: market indices that are positively correlated with depreciation in the dollar exchange rate are less risky (since they offer hedging against loss in

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[6] As said above, we only have data for the "Fama risk-free rate" up to October 1996

[7] We also used the MSCI-provided world index, with no qualitative change in results

[8] Ferson and Harvey (1993) adopt a mimicking portfolio approach, *i.e.* they construct a portfolio that is maximally correlated to the change in the log of G-10, and they compute its excess return. When they use this portfolio excess return instead of the simple change in the log of G-10, they obtain similar results.

the value of the dollar) and hence offer a lower excess return.[9]

In the specification of column 2, we introduce "Judicial Efficiency" among the explanatory variables. The coefficient of this variable is positive and significant, indicating that in countries with more efficient judiciary the excess return on equity capital is larger. This result is confirmed in all the specifications of Table 1, and is clearly the opposite of what suggested by Figure 4. The estimated value (.001) of the coefficient on this variable implies that a move from the average value for these markets of 9.37 to a perfect 10 would be associated with a 75 basis point increase of the required return on a yearly basis. It should be noticed that "Judicial Efficiency" has rather little variation among the developed markets. In most of them it is at the highest level of 10. Italy and Spain are the only countries where it is substantially lower – around 6. This implies an astonishing result for Italy and Spain: if their judicial efficiency had been in line with other countries its required return on equity would have been raised by about 5% per annum. As we shall see, the sign and precision of the estimated effect of "Judicial Efficiency" carries over well beyond this sample.

In column 3, we include the index "Anti-Director Rights" among the explanatory variables. Its coefficient is not significantly different from zero.

In columns 4 and 5, we repeat the specifications in columns 2 and 3, after replacing the index "Judicial Efficiency" with the variable "Rule of Law", and find similar results. The point estimate for Rule of Law is positive, although not precisely estimated. As in columns 2 and 3, the estimated coefficient on the anti-director rights variable is not statistically different from zero.

We also tried the specifications for columns 2 and 3 using other indices from La Porta *et al.* (1998a), such as measures of corruption in the government, risk of expropriation, risk of contract repudiation by the government, and the perceived quality of accounting standards. The small number of observations and the high degree of collinearity of the indices prevented us from including all of them simultaneously in our specifications. However, for each of these indices (excluding that for the risk of expropriation, which exhibits almost no variation across the 18 developed markets of this sample), the estimated coefficients of the other variables

[9] We tested for deviations from the CAPM, by including among the regressors the square of beta and the variance of the residuals of our market model regressions – a proxy of unsystematic risk. The coefficients of both variables were not significantly different from zero.

included in the specifications of columns 2 and 3 are virtually unchanged.

We also estimated a specification (not reported) which includes the legal origin dummies among the regressors. None of them turned out with a statistically significant coefficient, and the estimates of all the other coefficients remained qualitatively unaffected. However, we fear that this may be at least partly due to the paucity of the degrees of freedom.

The MSCI sample used in these regressions includes Hong Kong. Since we suspect that this observation may be an outlier (see Figure 6), we also re-estimated the regressions of Table 1 without this observation. Excluding it does not change the qualitative results of Table 1, apart from lowering the point estimates for beta and making the estimated intercept significantly different from zero in the specification of column 1 (although it is still zero in the other specifications). The estimated coefficient for Rule of Law in the specifications of columns 4 and 5 for the sample without Hong Kong is positive and significantly different from zero.

4.1.2 Lintner Regressions: All Markets

In Table 2, we extend the sample size to include as many markets as possible, while requiring all markets to be included over the same time interval and at the same time keeping the interval long enough to allow reasonably precise estimates of the risk factors' sensitivities. To balance these conflicting desiderata, the best strategy appeared to be to include all the markets that enter the MSCI and EMDB databases before 1988. We compute the average excess returns and the sensitivities using monthly data over the interval between January 1987 and October 1996.[10]

Including both developed and emerging markets in the same empirical asset pricing specification presents some challenges. The empirical international finance literature, briefly surveyed above, has consistently found that possibly different risk factors are priced in the two subsets of markets. This can be seen also in Figure 7 (which plots the capital market lines for MSCI and EMDB countries) and Figure 8 (which plots the relationships between average excess returns and idiosyncratic risk in developed and emerging markets). Therefore we adapt a pragmatic approach and let the data guide us in the selection of the relevant factors needed to purge the excess returns of their risk premium component.

[10] Including Finland, Ireland and New Zealand, that enter the MSCI database in 1988, does not alter the results.

In the specification of column 1 of Table 2 we let the estimated values for betas, real exchange rate risk sensitivities and idiosyncratic risks free to affect differently the average returns in the two sub-samples of countries.[11] We cannot reject the hypothesis that the coefficients of the real exchange risk sensitivity, of the idiosyncratic risk for developed markets and of the betas for emerging markets are jointly equal to zero. Therefore, we adopt the constrained specification of column 2 as our baseline specification.[12]

In column 3 we include the measure of judicial efficiency, and its estimated coefficient is positive, though not precisely estimated.

Since the intercept is not significantly different from zero (consistently with the CAPM model), in column 4 the equation is re-estimated without constant, and the score for judicial efficiency enters again with a significantly positive sign (as in Table 1). This pattern of results from columns 3 and 4 is found when any of the other indexes from ICRG is used. For the sake of brevity, we only report the results including the "Rule of Law" index. As a general rule, firms in countries with better values for these indices (i.e., where the judicial system is more efficient, respect for the law is higher, corruption is perceived to be less widespread or the risks of expropriation or contract repudiation are lower) reward equity capital with a higher rate of return. This is also true for countries with better accounting standards.[13]

A caveat is the possible presence of a sample selection bias similar to that studied by Jorion and Goetzmann (1999). The true relationship between the return on equity capital and, say, judicial efficiency may be negative, at least when this variable takes very low values, but we may fail to detect it because below a minimum threshold for judicial efficiency the stock market in an emerging economy fails to exist. In these situations where the efficiency of the judicial system is very low, or the risk of expropriation is really high, the required return on equity is effectively infinite, so that the stock market fails – or ceases – to exist.

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[11] We also included in the list of risk factors the squares of the betas, but found that they do not have independent explanatory power. We also allowed a different intercept for EMDB countries, but its estimated coefficient was not significantly different from zero.

[12] The exchange risk sensitivity for emerging markets enters with a positive estimated coefficient. This suggests that it might be proxying for some other unspecified risk factor, since one would expect a negative sign on this variable. Alternatively, this may reflect the fact that the exchange rate index does not include emerging markets' exchange rates.

[13] We have also included the "anti-director rights" index and the dummy for the one-share/one vote provision, but none has an independent estimated effect significantly different from zero.

4.1.3 Fama-MacBeth Cross-Sectional Regressions: Developed Markets

The empirical specifications in the above two subsections relate cross-sectional average excess returns to cross-sectional average sensitivities to the relevant risk factors and to institutional variables. A more flexible way to test whether, after controlling for the risk premium component of excess returns, a role is also played by institutional factors is to use the Generalized Least Squares methodology proposed by Litzenberger and Ramaswamy (1979), as a refinement of the Fama-Macbeth (1973) approach, widely used in explaining the cross-section of stock returns.

This procedure involves estimating an empirical model of the form:

$$r_{it} = \gamma_{0t} + \sum_{k=1}^{K} \gamma_{kt} x_{it} + \varepsilon_{it}, i = 1,2,...,N, t = 1,2,...,T, \quad (1)$$

where r_{it} is the excess return on country index *i* for month *t*, x_{it} includes the sensitivities of country index *i* to the relevant risk factors estimated for month *t* and (a vector of) the institutional variables for country *i* at time *t*, and ε_{it} is a disturbance with variance possibly changing across *i* and *t*. *N* is the number of countries included in the estimation sample, and *t* is the number of time data points (*i.e.* the number of monthly observations used in estimation). In equation (1) the sensitivities for month *t* in year *j* are estimated over the previous 5 years of monthly data (*i.e.* on the data for years *j*-4 up to *j*).

The original Fama-Macbeth procedure consists of estimating equation (1) cross-sectionally for each month, so as to obtain a time series of estimated coefficients $\hat{\gamma}_{kt}$ for γ_k, *k*=1,..,*K*. If each of the estimates is assumed to be drawn from a stationary distribution, then the pooled estimates $\hat{\gamma}_k$ are:

$$\hat{\gamma}_k = \frac{1}{T} \sum_{t=1}^{T} \hat{\gamma}_{kt} \quad (2)$$

and their variance is:

$$Var(\hat{\gamma}_k) = \frac{\sum (\hat{\gamma}_{kt} - \hat{\gamma}_k)^2}{T(T-1)}. \quad (3)$$

However, this procedure does not take into account that the slope coefficients in the cross-sections for different months are estimated with different precision. The refinement proposed by Litzenberger and Ramaswamy (1979) addresses exactly this problem. They show that if the monthly estimators $\hat{\gamma}_{kt}$ are serially uncorrelated, the pooled GLS estimators γ_k are the

weighted means of the monthly estimates, where the weights are inversely proportional to the variances of these estimates. Specifically:

$$\hat{\gamma}_k = \sum_{t=1}^{T} Z_{kt}\hat{\gamma}_{kt} \text{ where } Z_{kt} = \frac{[\text{Var}(\hat{\gamma}_{\text{kt}})]^{-1}}{\sum_{t=1}^{T}[\text{Var}(\hat{\gamma}_{\text{kt}})]^{-1}} \quad (4)$$

and

$$Var(\hat{\gamma}_k) = \sum_{t=1}^{T} Z_{kt}^2 Var(\hat{\gamma}_{kt}). \quad (5)$$

In Table 3 we report the results from this estimation procedure for the 18 developed markets for which return data are available from January 1970 in the MSCI database. We use 5 years of data (1970-74) to obtain the starting estimates for the betas and the real exchange risk sensitivity, and run 282 cross-section regressions for the months from January 1975 to October 1996.

In column 1, we report our preferred specification for the asset pricing model. We include a quadratic form for beta (along the lines of the specification used by the original Fama-Macbeth (1973) article). We test and reject the hypothesis that the idiosyncratic risk and the real exchange risk have additional explanatory power, and therefore these variables are not included in the results of Table 3.

In column 2 we insert also the index for the efficiency of the judicial system. As in Table 1, we find that the equity markets of countries with more efficient judicial systems pay a higher total excess return. In column 3 we include the score “Anti-Director Rights” among the regressors and find that its coefficient is very small and not significantly different from zero. Columns 4 and 5 repeat the specifications of columns 2 and 3, replacing the efficiency of the judicial system with the “Rule of Law” index. As in Table 1, the estimated coefficient of the latter variable is positive, though estimated less precisely than that of judicial efficiency.

In specifications that we do not report for brevity, we also investigate the relationship between the risk-adjusted return on equity and the degree of perceived corruption among the government officials. We find that in countries where corruption is less of a problem, the excess return over and above the reward for risk is higher, consistently with the results from the Lintner estimation procedure mentioned in subsection 4.1.1. The only ICRG index for which we find the opposite relationship with the risk-adjusted return on equity is the index measuring the risk of expropriation (stocks in countries where this is higher offer on average a higher return). When included by itself (in addition to the risk factors in our preferred specification as per column 1 in Table 3), its coefficient is negative and marginally

significant. When included with either the efficiency of the judicial system or the rule-of-law index, its coefficient is negative and very precisely estimated. An important role in this relationship might be played by Hong Kong, which has the highest risk of expropriation and the highest average excess return in the sample[14].

The dummy variables for the origin of the legal systems, instead, never have any explanatory power in conjunction with the other institutional variables, particularly with the rule-of-law index, and for brevity we do not report the corresponding specifications.

4.1.4. Fama-Macbeth Cross-sectional Regressions: All Markets

In Table 4 we report results from the Lintzerberger-Ramaswamy estimation procedure for the same sample covered in Table 2, that is, the cross section of the developed and emerging markets whose returns data are available at least from 1982.[15]

As usual, in column 1 we propose our preferred specification for the underlying model of the risk premium. In our specification search, we proceeded as for Table 2. We started by allowing beta, beta squared, the real exchange risk sensitivity and the idiosyncratic risk to impact differently the expected excess return in the two sub-samples (developed and emerging markets). We found that one cannot reject the hypotheses that the idiosyncratic risk matters only for emerging markets, that the impact of both the linear and the quadratic term in the betas is the same across the two sub-samples and that, controlling for these risk factors, the real exchange risk factor does not have explanatory power.

In column 2 we extend the list of regressors to include the score for "Judicial Efficiency" and, in line with the results in the previous sections, we find it positively related to the risk-adjusted excess returns. In column 3, we include the index "Anti-Director Rights" together with the measure of judicial efficiency, and find that its coefficient is small and statistically not different from zero. In column 4 and 5 we repeat the specifications of columns 2 and 3, replacing the "Judicial Efficiency" index with the score for "Rule of Law". We find, once again, that if one controls for the latter, the coefficient of the "Anti-Director Rights" score is

[14] Indeed, if one excludes Hong Kong from the sample, the coefficient on the risk of expropriation is positive (higher returns in countries with lower risk), though not significantly different from zero (whether one controls or not for judicial efficiency or rule of law).

[15] Since we want our estimation to cover the same period (1987-1996) as in Table 2, we use data from the previous 5 years (1982-1986) to compute the starting estimates for betas and the real exchange risk sensitivity for all countries.

small and not significantly different from zero. Agency problem considerations – as least insofar as they are proxied by the synthetic index constructed by La Porta *et al.* (1998a) – do not appear to matter for the cross-section of excess returns.

4.2 Accounting Measures of the Cost of Capital

From an accounting standpoint, the profitability of a listed company is often measured by valuation ratios such as the dividend yield and the earnings/price ratio. In equilibrium, this profitability coincides with that required by the shareholders to hold the shares of the company in their portfolio, and therefore with the required rate of return on equity. By its nature, this measure needs to be adjusted, in an international comparison, for different inflation and growth prospects. Bekaert and Harvey (1997) and Errunza and Miller (1998), among others, rely on the dividend yield as a measure of the cost of capital. As pointed out by Bekaert and Harvey (1997, p. 9), "the dividend yield has the advantage of being directly measurable – that is, it need not be pre-estimated – and being a stationary variable."

In this sub-section, we use an augmented version of the so-called "Gordon model" of security valuation to relate the cross-country dispersion in the return on equity to international differences in legal and institutional settings. Under fairly general assumptions, the stock market index in country *i* at time *t*, P_{it}, is the expected value of discounted dividends from the component stocks into the indefinite future:

$$P_{i,t} = E_t \sum_{j=1}^{\infty} \frac{D_{i,t+j}}{(1+k_{i,t+j})^j} \qquad (6)$$

where E_t is the expectation conditional on information known at time *t*, $D_{i,t+j}$ is the dividend paid out by the companies listed in country *i* at time *t+j*, and $k_{i,t+j}$ is the per-period risk-adjusted discount factor between time *t* and *t+j* relevant for the stream of dividends from country *i*. The simplest version of this valuation approach assumes k_i to be constant and $E_t(D_{i,t+j}) = D_{i,t}(1+g_i)^j$, where $D_{i,t}$ is the current dividend and g_i is a constant growth rate specific to country *i*. Under these assumptions, the expected dividend yield becomes:

$$\frac{D_{i,t}}{P_{i,t}} = k_i - g_i \,. \qquad (7)$$

Of course, to compute the risk-adjusted required rate of return one needs a model of the

equilibrium determination of the rates of return on stocks with different risk characteristics. Under the international CAPM, the risk of stock market index *i* is only due to its covariance with the world aggregate portfolio (and to its covariance with real exchange rate movements, if the latter is priced). If in addition the required rate of return on equities depends on the institutional variables capturing the efficiency of the legal and judiciary systems and the degree of protection of minority shareholders, k_i may be augmented as follows:

$$k_i = f_i(\beta_i) + \gamma p(L_i) \tag{8}$$

where β_i is the country's vector of betas with the relevant risk factors, $p(\cdot)$ is a polynomial and L_{it} is a vector of variables proxying for the quality of legal institutions and the degree of investor's protection in country *i*. If the classic international CAPM holds, then $f_i(\beta_i) = \alpha r_i + \eta\beta_i$, where η is the market price for risk (defined as the excess return on the risk-free rate of the world stock market), r_i is the yield on a long-term "risk-free" domestic security (in the estimation we use the yield on a 10-year government bond, drawn from the IBES database), and $\gamma = 0$. The nominal domestic interest rate must be included, since our estimates of the expected growth in earnings per share are in nominal terms and the dividend yields are denominated in different currencies. As a result, we must allow for different yields to reflect different expected inflation rates, even if all other factors were the same across markets. In the estimation, we shall allow for time-varying k_i's, that is, we shall let the expected return on country *i*'s stock market index vary over time. However, the fact that for some dates data are available only for a few markets prevents a cross-sectional regression approach and therefore limits the flexibility of the functional form for the required rate of return in equation (8). We impose that the market price for risk and the coefficient γ on the "institutional variables" be constant, that is:

$$k_{i,t} = \alpha r_{it} + \eta\beta_{it} + \gamma p(L_{it})$$

Imposing this linear linear specification for the risk premium component of the return on equity in eq. (8), one obtains the specification to be estimated:

$$\frac{D_{i,t}}{P_{i,t}} = \alpha r_{it} + \eta\beta_{it} + \gamma p(L_{it}) + \delta g_i + \varepsilon_{it}, \tag{9}$$

where the restriction $\delta = -1$ should hold if (i) this simple version of Gordon's model were true and (ii) if our measure of dividend growth were free of measurement errors. In fact, we

expect neither of these to be true. First, the expected growth of dividends is unlikely to be constant, as assumed in the derivation of (7). In addition, our proxy of expected dividend growth – being a survey-based measure – may be vitiated by measurement errors, due for example to the selection of survey respondents, or to imperfect coincidence between their reference portfolio and the country portfolio used to construct our dividend yields. Last but not least, we proxy dividend growth with earnings growth, which is inappropriate unless payout ratios were constant. For all these reasons, we do not expect the restriction $\delta = -1$ to hold in our regressions.

Equation (9) can be estimated for each time period for which we have data on the dividend yield of the stock market index. It requires an estimate for β_{it}. This, as before, can be obtained by a first-stage regression of the market *i* total (excess) return on the world excess return up to a time period strictly before *t*, so as to avoid covariance between β_{it} and ε_{it}. In the empirical specification, we allow for the possibility of cross-market correlation and heteroskedasticity for the errors ε_{it}.

Notice also that from equation (9) different specifications can be derived, which involve other familiar (and widely used in practice) accounting measures of value. For example, if one assumes that dividends are a common fraction of earnings in all countries, then one immediately obtains another testable specification involving earning-price ratios:

$$\frac{E_{i,t}}{P_{i,t}} = \alpha' r_{it} + \eta' \beta_{it} + \gamma'_t \; p(L_{it}) + \delta' g_i + \varepsilon'_{it}, \qquad (10)$$

where the superscript primes indicate that the coefficients in (10) may differ from the analogous coefficients in (9) because of division by the payout ratio *b*, assumed to be common across countries and constant over time. Since, however, differences in tax treatment of dividends across countries may affect payout ratios, we include a measure of the relative stance of the tax system towards different uses of earnings as a separate regressor in our estimation. The measure is drawn from La Porta *et al.* (1998b), who actually find that payout ratios are only tenuously correlated with the tax disadvantage of dividends relative to capital gains.

4.2.1 Dividend Yields

Our empirical results for the dividend yields are reported in Table 5. Here we estimate

equation (9) with monthly observations on the dividend yields for 18 developed markets. We cannot include emerging markets for lack of data. In the columns of this table we report various specifications, which include different institutional variables in the vector *p(L)*. To interpret our results, it is useful to keep in mind the scale of the dependent variable in our regression. In our sample, the average dividend yield is 0.0283, its standard deviation is 0.0119 and its range is between 0.002 and 0.079.

In column 1, we report our baseline specification. We include the domestic government bond yield, the expected growth in earnings per share and the market beta as the determinants of the required rate of return. We estimate market *i*'s beta for month *t* by regressing market *i*'s excess return on the world market portfolio's excess return for the previous 60 months. Consistently with our theoretical model, we find positive coefficients on the domestic government bond yield and the beta, and a negative (though imprecisely estimated) coefficient for the expected growth in earnings per share. These results hold in all the specifications of Table 5. In our baseline specification, we also include the legal origin dummies, and the dummy variable "One Share/One Vote". We allow for the differential tax treatment of dividends to have an impact on the dividend policy of firms, by including the variable "Dividend Tax Preference" from La Porta *et al.* (1998b). This variable is defined as the ratio of the net-of-taxes value to outside shareholders of 1 dollar in earnings distributed out as dividends to the net-of-taxes value of 1 dollar of earnings retained in the firm. It is meant to capture the extent of tax disadvantage borne by dividends relative to capital gains.

Even after controlling for undiversifiable risk and adjusting the accounting measures for differences in expected inflation and growth prospects, the legal origin dummies play an important role in explaining the cross-sectional behavior of the dividend yield. Using this measure of the return on equity, countries with German and Scandinavian legal systems have lower risk-adjusted equity returns than English-origin countries. The coefficient of the "One Share/One Vote" variable is negative, consistently with agency theories of corporate governance. The coefficient of the tax variable has the expected positive sign, although it is small: a move from the average 0.75 to a non-distorting value of 1 would increase the dividend yield by 0.0002, or 2% of a standard deviation.[16] The regression has a good fit: the

[16] For an analysis of the possible reasons why dividend payouts across markets appear to be so little sensitive to tax considerations, see La Porta *et al.* (1998b). On an intuitive level, signalling theories of dividends (and, in particular, "burning money" theories of dividends) argue that firms use dividends exactly because they are a relatively costly way of disboursing cash out to shareholders, to signal their financial strength. Hence they might

R^2 for the specification in column 1 is 0.66.

In column 2, we further include the index for the degree of legal protection of minority shareholders from managers' opportunism ("Anti-Director Rights"). While our results for this variable in the previous section were mostly inconclusive, we find a negative and statistically significant coefficient (-0.0007), in accordance with the agency theory of the cost of external funds. Such an estimate, which is representative of our coefficient estimates across the specifications in Table 5, is also economically important. A move from 2.775 (the mean score for anti-director rights in the sample of Table 5) to a perfect score of 5 would reduce the dividend yield by 0.0017, or approximately 15% of the standard deviation of the dividend yield variable in our sample. We find that the effects of differences in the four legal origins are not fully absorbed by differences in the legal protection of minority shareholders. The coefficients of the Scandinavian and German origin dummies maintain their sign and their significance increases somewhat upon controlling for the degree of minority shareholders' protection, while the coefficient on the French legal origin dummy becomes negative, possibly reflecting this variable's negative correlation with the LLSV measure of minority shareholders' legal protection.[17]

In column 3, we include our measure of judicial efficiency. Consistently with our results in the previous section, we find that firms in countries with a higher degree of judicial efficiency pay a higher risk-adjusted return on their equity capital (our index has an average of 9.39, with a range between 6.25 and 10). The other variables' coefficients are significantly different from zero. In column 4 we include the anti-director rights index, and we obtain a negative, though imprecise, estimate. The R^2 in the specifications of columns 3 and 4 is a remarkable 0.75.

In columns 5 and 6 we repeat the specifications of columns 3 and 4 respectively, controlling for the rule of law index *in lieu* of the efficiency of the judicial system. Again, we find that such a variable enters with a statistically significant and economic relevant positive coefficient.[18] At the same time, the anti-director rights index enters with a statistically

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explain why in countries where dividends are more costly they are used relatively more often. See Bernheim (1990) for an example of such theories.

[17] While the pattern documented in columns 1 and 2 is a bit extreme, we find that including the anti-director rights score reduces the coefficient on the French dummy across all our proposed specifications (see below).

[18] The rule of law index averages 9.43 in our sample and has a range from 7.8 to a perfect 10. A move from 7.8 to 10 is associated, through our point estimate, to an increase in the dividend yield of 0.0045, or 38% of its

significant negative sign. Controlling for it, the French dummy enters with a negative and significant sign as well (again a confirmation that the unconditionally higher return on equity in countries with French legal origin may be due to worse protection of minority shareholders).

In column 7 we repeat the specification of column 6 (including the anti-director rights score) but we also control for the quality of accounting standards. This turns out to enter with a positive and significant coefficient.[19] The same is true for other two measures of quality of the business environment: corruption in government and risk of contract repudiation. The only index whose coefficient is not statistically different from zero is the risk of expropriation, which may reflect the fact that expropriation risk is rather similar across developed markets. The specifications including these latter three variables are not reported for brevity.

The anti-director rights index enters with a negative sign in the specifications of columns 2 and 6. The German and Scandinavian dummies enter all specifications with a negative and rather precisely estimated coefficient, and the French dummy is positive, especially when one does not control for the degree of protection of minority shareholders. Finally, the coefficient of the dividend tax preference variable is positive in all specifications of Table 5 and that of the one-share/one-vote dummy is negative in all of them.

4.2.2 Earnings-Price Ratios

In Table 6 we report our results for the earnings-price (EP) ratios. Again, data limitations constrain us to the set of developed markets. The dependent variable is defined as the reciprocal of the PE ratio as obtained from IBES[20]. From equation (10) we expect to find that the domestic government bond yield and the risk factor beta enter with a positive sign, while the expected growth rate in earnings per share with a negative one. Indeed, the results from the previous subsection on the estimated impact of measured institutional differences on the international dispersion of return on equity are confirmed.

In column 1, as usual, we report our baseline specification. This includes the domestic

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standard deviation.

[19] The index for accounting standards averages 68.81 in our sample, and has a range between 54 and 83. Through our point estimate (0.0002) therefore this variable can potentially explain an increase in the dividend yield of 0.0002*(83-54)=.006, or 49% of its standard deviation.

[20] We use the earnings/price ratio instead of the price/earning ratio to avoid the problems which arise when earnings are very small (see also Ferson and Harvey, 1997).

government bond yield, the expected growth in earnings per share and the beta with the world market portfolio (estimated on the previous 60 months, market by market), as well as the one-share/one-vote dummy and the origin dummies.[21] To interpret our results, the reader should keep in mind that our dependent variable averages 0.072 in the sample, has a standard deviation of 0.021 and a range between 0.014 and 0.135. The domestic bond yield, the expected growth rate and beta all enter with significant coefficients, whose signs are in line with our a-priori expectations.

As in all the previous tables referring to developed countries, all our institutional variables enter with positive signs. The "general environment" variables, that is the efficiency of the judicial system, the rule of law, the degree of corruption among government officials, the risk of contract repudiation and of expropriation, the quality of accounting standards, all enter to increase the required return on equity, *ceteris paribus*. As in Table 5, instead, the degree of protection of minority shareholders enters with a negative sign and is precisely estimated in most specifications. And, again as in Table 5, the Scandinavian, German and French origin dummies' impact goes in the direction of making the average return on equity lower in the corresponding countries than in the English origin one. Anglosaxon markets appear to have conditionally larger returns on equity than all other developed countries' markets, after controlling for both risk and measured institutional differences.

The one-share/one-vote dummy enters with a large and negative coefficient, in accordance with the predictions of the agency theory of the cost of external funds, as well as with our results in the previous subsection. For instance, Japan and Singapore, who have the one-share/one-vote compulsory requirement in their commercial codes, *ceteris paribus* have a significantly lower EP ratio than markets that lack this legal provision.

4.3 The Excess Return on Equity in the Primary Market

In the primary market, the excess return earned on new issues in the first days immediately after the quotation coincides with the so-called initial public offering (IPO) underpricing. So in this section we use the estimates of IPO underpricing described in subsection 3.3 to

[21] In the specifications we report, we do not include the dividend preference variable, as the theory suggests that it should not matter. However, we have run the same regressions that we report in table 6 including the dividend tax preference variable. Although usually precisely estimated, its coefficient changes sign across specifications, making us somewhat skeptical as to its interpretation. It enters with a positive sign if one controls for the anti-director rights score, otherwise it enters with a negative sign.

investigate whether international differences in this variable can be explained by cross-country differences in the institutional variables analyzed throughout the paper. The evidence is to be taken with a grain of salt due to the paucity of the sample and the heterogeneity of the measures of IPO underpricing.

Theory suggests that differences in accounting standards should be a key explanatory variable of the international variation in IPO underpricing. The presence of IPO underpricing is generally viewed as the product of informational asymmetries between the generality of investors (the "uninformed" bidders) and the "smart money" in the market for new issues. Shares initially quote at a discount to compensate the uninformed investors for their expected losses to the better informed ones. This informational asymmetry and the resulting IPO discount are likely to be greater where accounting practices are lax and opaque.

Figure 9 is consistent with the prediction of the theory: there is a simple negative correlation between IPO underpricing and accounting standards.[23] This result is confirmed by the regression reported in the first column of Table 7: the correlation is indeed negative and precisely estimated. In the rest of Table 7 we investigate if this result is robust to the introduction of other institutional variables among the explanatory variables. The correlation remains negative and significant when one controls for most of the other institutional variables, such as anti-director rights (whose coefficient is – surprisingly – positive, though not precisely estimated) and rule of law (column 4). In specifications which include corruption, risk of contract repudiation and the "one-share/one-vote" variable (not reported), the latter does not enter with a significant coefficient.

The magnitude and precision of the coefficient of the accounting standards variable are considerably reduced only when the measure of judicial efficiency is entered as an additional

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[22]In figures 9 and 10, some countries appear more than once. That's because, for those countries, we have data on the average IPO underpricing for different issuing procedures. The letter in parenthesis after the country's name indicates to which issuing procedures the observation refers, following the same convention as in Table 7. The letter "a (b)" indicates that in the IPO the offer price is fixed before (after) the acquisition of information and the allocation is discretionary. The letter "c" indicates that in the IPO the offer price is fixed before the acquisition of information and the allocation is not discretionary. The letter "e" signals the presence of binding regulatory constraints (see Table 2 in Loughran et al., 1994).

[23]In figures 9 and 10, some countries appear more than once. That's because, for those countries, we have data on the average IPO underpricing for different issuing procedures. The letter in parenthesis after the country's name indicates to which issuing procedures the observation refers, following the same convention as in Table 7. The letter "a (b)" indicates that in the IPO the offer price is fixed before (after) the acquisition of information and the allocation is discretionary. The letter "c" indicates that in the IPO the offer price is fixed before the acquisition of information and the allocation is not discretionary. The letter "e" signals the presence of binding regulatory constraints (see Table 2 in Loughran et al., 1994).

explanatory variable, presumably due to their collinearity. In fact, Figure 10 confirms a strong negative correlation between IPO underpricing and judicial efficiency. This probably captures simply the fact that where courts can be trusted to do their job honestly and efficiently, accountants can be trusted to do the same: their honesty and accuracy may partly result from the threat of swift judicial suits if they misbehave.

Altogether, the main result in this table appears to be the fact that good accounting standards appear to reduce the cost of capital on primary equity markets. The special relevance of this institutional variable in the context of the primary equity market accords well with the theory.

5 Concluding remarks

In this paper we try to assess the impact of legal variables on the required return on equity for firms in a cross-section of both developed and emerging stock markets. We have used several measures of the return on equity, such as the total return on national equity markets (controlling for risk premia), accounting measures of firms' profitability such as dividend yields and earning-price ratios (controlling for international differences in growth and inflation), and IPO average excess returns (IPO underpricing).

We have found an interesting set of regularities. First, when we use secondary market return on equity, all our estimates reveal a positive correlation between the risk-adjusted return on equity and "general" measures of the quality of institutions, like efficiency of the judicial system, respect for the law, lack of corruption among government officials, quality of accounting standards and low risk of contract repudiation and nationalization. The same result is found when we use accounting measures of the rate of return on equity: both the dividend yield and the earnings-price ratio are positively correlated with these general measures of the quality of institutions.

As explained in section 2, these findings can be rationalized in the context of imperfectly integrated equity markets. When the world capital markets are not fully integrated, the supply of funds at the national level is upward sloping, rather than perfectly horizontal. In this scenario, our findings can result from two types of effects of better institutions. First, more effective courts and higher respect for the law can reduce the amount of private benefits that the management can extract from corporate resources, thus allowing companies to credibly pledge higher returns to investors. Second, better institutions can have a positive effect on the

profitability of companies, quite apart from their impact on financial relationships. Since a wider menu of contracts can be expected to be enforced in a cost-effective way, the marginal productivity of physical investment is increased: there is more demand for equity funding in equilibrium and hence a higher rate of return. Notice that both types of effects would result in an increase in the amount of equity funding used by companies, consistently with the evidence in La Porta *et al.* (1997).

Our finding may appear harder to reconcile with one of the results of Demirgüc-Kunt and Maksimovic (1998): they report that the return on assets of the firms in their sample is negatively correlated with the same rule-of-law indicator used in our study, controlling for various macroeconomic variables (inflation, deposit bank assets and stock market capitalization divided by GDP, etc.). The contradiction between the two studies − apart from the different measures of profitability and data used − may however be due to the fact that Demirgüc-Kunt and Maksimovic fail to control for risk in their regression. As we know from Figure 2, the unconditional correlation between the return on equities and rule-of-law is clearly negative. Nevertheless our regressions show that, once risk is controlled for, the partial correlation between these variables is positive.

A *caveat* has to do with a possible sample selection problem. The positive relation we uncover between institutional variables and the return on equity may be biased by the non-observability of the latter in countries where the stock market does not exist (or is so tiny that its stock prices are not internationally disseminated). In these countries, the required return on equity capital is effectively infinite since external equity is hardly available, and the quality of legal institutions and judicial enforcement is abysmal. The overall relationship between the risk-adjusted return on equity and the quality of laws and courts may actually be *U*-shaped. Even so, however, the upward-sloping branch of this *U*-shaped relationship documented by our results is a surprisingly robust regularity: even restricting our analysis to developed markets, whose institutions are relatively homogeneous, the correlation between the risk-adjusted return on equity and the quality of institutions is both statistically significant and economically relevant.

Our second key result concerns the protection of shareholder rights. We find that, when the return on equity is measured by the rate of return of listed equities, it is not correlated with any of the available measures of shareholder rights. However, when the cost of capital is measured with either the dividend yield or the earning-price ratio, it is negatively correlated

with measures of the protection of shareholder rights, controlling for risk, the growth of earnings and the "general institutional features" just discussed. In light of the model discussed in section 2, we can interpret this result as reflecting the lower auditing and monitoring costs to be borne by shareholders in countries where their rights enjoy a better protection. This would then translate in a lower required rate of return for companies, all else being equal.

The different estimates for the effect of shareholder protection obtained with the two different measures of the return on equity may be the result of a potential bias in secondary market returns in the presence of regime shifts. Suppose, for example, that some unanticipated institutional change permanently increases stock prices, leaving the required rate of return on equity unaffected. An econometrician who relies on stock return data will record a very high positive return in conjunction with the improvement in institutions. This may introduce an upward bias in the estimated relationship between a certain feature of institutions and the rate of return on equity. A positive coefficient may be found even if the true coefficient is zero. The accounting measures of return on equity are immune from this bias.

Thirdly, we have found that the origin of the legal code is an important determinant of the international variation in the risk-adjusted return on equity. This is an important result, because the origin dummies are, among all the variables we use, probably those that can be more safely thought to be truly exogenous. La Porta *et al.* (1997) found that countries in the English legal tradition area have a bigger stock market capitalization relative to their GDPs and more external equity financing than countries in the French, German or Scandinavian legal families. We find that if one controls for general institutional features like the efficiency of the judicial system, the rule of law or the quality of accounting standards, firms in the German and the Scandinavian families pay a lower risk-adjusted return than firms in Anglo-Saxon countries. This suggest that companies in these countries are more profitable than in other countries, all else being equal, including measurable institutional differences. A possible interpretation is that the "English origin" dummy captures some unmeasured characteristics in the social organization of these countries that makes their companies more profitable than companies located elsewhere. This result is of interest also because of its connection with international differences in the equity premium puzzle documented by Jorion and Goetzmann (1999).

Our fourth, and final, result concerns the cost of capital in the primary market. We find that IPO underpricing – an important component of the total cost of capital for newly listed

companies – is negatively and significantly correlated with the quality of accounting standards across countries. This accords with adverse selection based theories of IPO underpricing, as in countries where accounting information is less reliable the informational gap between informed and uninformed investors is bound to be larger at the IPO stage.

Our analysis leaves a number of open issues to our future research. One is the robustness of our results, which may be checked by replicating our study for an international cross-section of companies. An intriguing issue is the precise mechanism through which more efficient enforcement induces a higher return on equity. Another is whether the unreliability of legal institutions featured by many countries may generate not only international differences in the cost of capital but also the international segmentation of equity markets documented by so many asset pricing tests. Finally, a fascinating but difficult line of research would involve endogenizing the evolution of the institutional framework, so as to understand why some countries end up having and retaining “bad” institutions.

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Table 1. Average Excess Return, Risk and Institutional Variables in Developed Markets

The dependent variable is the average monthly total excess return in US dollars for the markets of the MSCI database present from January 1970 (excluding Hong Kong). The safe rate of return is the yield on the 30-day maturity government bond with closest maturity (source: "Fama files" from CRSP database). The average excess return is computed over the period from Jan. 1970 to Oct. 1996. Beta and the Exchange Rate Factor are computed from OLS regressions estimated over the same intervals. Non-Systematic Risk is the standard deviation of the residuals obtained from the same regressions. All other variables are from La Porta et al. (1998a). T-statistics, computed with heteroskedasticity-consistent standard errors, are reported underneath the estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**
Beta	.009 (2.19)	.008 (2.03)	.008 (2.13)	.010 (2.63)	.009 (2.82)
Exch. Rate Factor	-.003 (-2.23)	-.003 (-2.30)	-.004 (-1.71)	-.004 (-2.42)	-.005 (-2.03)
Judicial Efficiency	-	.001 (3.37)	.001 (3.09)	-	-
Rule of Law	-	-	-	.0003 (0.38)	.0003 (0.38)
Anti-director Rights	-	-	.0003 (.57)	-	.0007 (1.00)
Intercept	.002 (0.63)	-.007 (-1.36)	-.007 (-1.42)	-.001 (-0.79)	-.003 (-0.38)
Number of Obs.	18	18	18	18	18
R Squared	.30	.48	.49	.31	.36

Table 2. Average Excess Return, Risk and Institutional Variables in Developed and Emerging Markets

The dependent variable is the average monthly total excess return in US dollars for the (developed) markets of the MSCI database and the (emerging) markets of the EMDB database, available from January 1987. The safe rate of return is the yield on the 30-day maturity government bond with closest maturity (source: "Fama files" from CRSP database). The average excess return is computed over the period from Jan. 1987 to Oct. 1996. Beta and the Exchange Rate Factor are computed from OLS regressions estimated over the same intervals. Non-Systematic Risk is the standard deviation of the residuals obtained from the same regressions. These variables are interacted with dummy variables to allow for different slope coefficients in the MSCI and EMDB sub-samples. All other variables are from La Porta et al. (1998a). T-statistics, computed with heteroskedasticity-consistent standard errors, are reported underneath the estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**	**6**
Beta in MSCI countries	.006 (1.26)	.007 (2.37)	.006 (1.80)	.006 (1.83)	.006 (2.08)	.007 (2.21)
Exch. Rate Factor in MSCI countries	.003 (.95)	-	-	-	-	-
Non-Systematic Risk In MSCI countries	.015 (.19)	-	-	-	-	-
Beta in EMDB countries	-.001 (-.43)	-	-	-	-	-
Exch. Rate Factor in EMDB countries	.004 (2.31)	.003 (2.89)	.003 (2.95)	.003 (2.99)	.003 (3.21)	.003 (2.41)
Non-Systematic Risk In EMDB countries	.141 (7.42)	.143 (8.75)	.152 (9.05)	.149 (12.49)	.144 (8.47)	.157 (12.142)
Judicial Efficiency	-	-	.001 (1.50)	.001 (2.00)	-	-
Rule of Law	-	-	-	-	.0001 (.30)	.0005 (1.91)
Intercept	.005 (1.36)	.005 (1.74)	-.001 (-.29)	Not Included	-.003 (-.75)	Not Included
Number of Obs.	37	37	37	37	37	37
R Squared	.775	.768	.779	N.A.	.768	N.A.

Table 3. Average Slopes of Monthly Cross-Sectional Regressions of Returns on Beta, Beta Squared and Institutional Variables in Developed Markets

Monthly total excess returns in US dollars for the markets of the MSCI database are regressed each month on the explanatory variables for the period from January 1975 to October 1996. For each year, Beta is estimated on the previous 60-month period. The safe rate of return is the yield on the 30-day maturity government bond with closest maturity (source: "Fama files" from CRSP database). All other variables are from La Porta et al. (1998a). Coefficients and standard errors are computed with the pooled GLS estimators. T-statistics are reported underneath the estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**
Beta	.023 (2.15)	.029 (2.63)	.022 (2.02)	.026 (2.29)	.024 (2.09)
Beta Squared	-.010 (-2.02)	-.013 (-2.48)	-.009 (-1.79)	-.011 (-2.04)	-.010 (-1.83)
Judicial Efficiency	-	.002 (3.51)	.002 (3.53)	-	-
Rule of Law	-	-	-	.0015 (1.76)	.0012 (1.41)
Anti-director Rights	-	-	-.0001 (-.13)	-	.0005 (1.15)
Number of Obs. in Cross-Sectional Regressions	18	18	18	18	18

Table 4. Average Slopes of Monthly Cross-Sectional Regressions of Returns on Beta, Beta Squared and Institutional Variables in Developed and Emerging Markets

Monthly total excess returns in US dollars for equity markets present in the MSCI and EMDB databases from January 1982 are regressed each month on the explanatory variables for the period from January 1987 to October 1996. The safe rate of return is the yield on the 30-day maturity government bond with closest maturity (source: "Fama files" from CRSP database). For each year, Beta is estimated on the previous 60-month period. Non-Systematic Risk in Emerging Markets is the standard deviation of the residuals from these first-stage regressions, interacted with a dummy which equals one if the market is from the EMDB and zero otherwise. All other variables are from La Porta et al. (1998a). Coefficients and standard errors are computed with pooled GLS estimators. T-statistics are reported underneath the estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**
Beta	.017 (3.25)	.022 (4.08)	.023 (4.14)	.012 (2.18)	.014 (2.60)
Beta Squared	-.011 (-3.04)	-.014 (-3.60)	-.014 (-3.68)	-.007 (-1.77)	-.008 (-2.10)
Non-Systematic Risk In Emerging Markets	.070 (3.77)	.126 (5.17)	.119 (4.84)	.108 (4.67)	.100 (4.31)
Judicial Efficiency	-	.002 (3.35)	.002 (2.92)	-	-
Rule of Law	-	-	-	.001 (1.31)	.0005 (.63)
Anti-director Rights	-	-	.0005 (.67)	-	.0011 (1.39)
Number of Obs. in Cross-Sectional Regressions	28	28	28	28	28

Table 5. Dividend Yields, Risk and Institutional Variables in Developed Markets

Monthly dividend yields, expected growth in earnings per share, and government bond yields are from the IBES global aggregates database (Datastream International). The dividend yield is the weighted yield based on the indicated annual dividend (IBES datatype: ADVYLD). EPS Growth is the weighted 12-month-forward growth in earnings per share (EPS) (IBES datatype: A12GRO). Bond Yield is a generic yield based on a local 10-year government bond (IBES datatype: AGBYLD). Beta for market *i* in month *t* is estimated from market model regressions of market *i*'s excess return on the world market excess return in months *t*-1,.., *t*-60. Institutional variables are from La Porta et al. (1998a). The data are an unbalanced panel of the MSCI markets from January 1987 to October 1996. Heteroschedasticity-consistent t-statistics are reported underneath estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**	**6**	**7**
GBY	.1235 (5.634)	.1338 (5.432)	.1468 (7.227)	.1514 (6.884)	.1161 (5.373)	.1313 (5.491)	.1372 (5.530)
EGEPS	-.0001 (-.907)	-.0001 (-.884)	-.0001 (-1.297)	-.0001 (-1.281)	-.0001 (-.981)	-.0001 (-.964)	-.0001 (-1.164)
Beta	.0056 (5.085)	.0057 (5.246)	.0103 (9.713)	.0104 (9.859)	.0084 (6.331)	.0092 (7.139)	.0059 (3.987)
Judicial Efficiency	-	-	.0053 (16.535)	.0053 (16.018)	-	-	-
Rule of Law	-	-	-	-	.0017 (4.345)	.0020 (5.307)	-
Quality of accounting standards	-	-	-	-	-	-	.0002 (4.194)
Anti-director Rights	-	-.0007 (-1.884)	-	-.0003 (-1.129)	-	-.0012 (-3.352)	-.0012 (-2.400)
One Share/One Vote	-.0164 (-17.067)	-.0157 (-13.382)	-.0205 (-21.529)	-.0201 (-17.836)	-.0164 (-17.105)	-.0152 (-13.227)	-.0164 (-14.167)
French Origin	.0012 (1.753)	-.0012 (-1.204)	.0103 (23.241)	.0090 (8.253)	.0021 (3.406)	-.0018 (-1.795)	-.0016 (-0.915)
German Origin	-.0083 (-15.435)	-.0102 (-10.418)	-.0062 (-11.467)	-.0070 (-8.027)	-.0088 (-14.799)	-.0119 (-12.752)	-.0092 (-4.925)
Scandinavian Origin	-.0180 (-34.185)	-.0191 (-24.141)	-.0209 (-30.367)	-.0214 (-27.683)	-.0193 (-30.792)	-.0213 (-26.555)	-.0199 (-16.696)
Dividend Tax Preference	.0045 (3.395)	.0017 (.0016)	.0157 (13.768)	.0143 (8.634)	.0062 (4.941)	.0020 (1.234)	-.0022 (-1.143)
Intercept	.0154 (10.118)	.0199 (10.077)	-.0513 (- 12.544)	-.0490 (- 10.088)	-.0042 (-.963)	-.0008 (-.186)	.0073 (1.303)
Number Of Obs.	1183	1183	1183	1183	1183	1183	1183
R-squared	.6569	.6583	.7411	.7414	.6627	.6660	.6686

Table 6. Earnings/Price Ratios, Risk and Institutional Variables in Developed Markets

Monthly data for earnings/price (EP) ratios, expected growth in earnings per share and government bond yield are from the IBES global aggregates database (Datastream International). The EP ratio is the reciprocal of the price/earnings (PE) data from IBES, defined as "Weighted average price/earnings ratio based on 12-month forward earnings" (IBES datatype: A12PE). EPS Growth is the weighted 12-month-forward growth in earnings per share (EPS) (IBES datatype: A12GRO). Bond Yield is a generic yield based on a local 10-year government bond (IBES datatype: AGBYLD). Beta for market *i* in month *t* is estimated from market model regressions of market *i*'s excess return on the world market excess return in months *t*-1,.., *t*-60. Institutional variables are from La Porta et al. (1998a). The data are an unbalanced panel of the MSCI markets from March 1987 to October 1996. Heteroschedasticity-consistent t-statistics are reported underneath estimated coefficients.

Regressors	**1**	**2**	**3**	**4**	**5**	**6**	**7**
GBY	.337 (11.323)	.349 (11.657)	.394 (14.152)	.421 (15.802)	.329 (11.765)	.344 (12.724)	.367 (11.876)
EGEPS	-.001 (-2.168)	-.001 (-2.234)	-.001 (-2.418)	-.001 (-2.588)	-.001 (-2.225)	-.001 (-2.361)	-.001 (-2.330)
Beta	.008 (4.834)	.008 (5.197)	.014 (7.194)	.015 (8.163)	.016 (7.117)	.019 (8.93)	.002 (1.042)
Judicial Efficiency	-	-	.006 (11.290)	.006 (12.189)	-	-	-
Rule of Law	-	-	-	-	.004 (5.297)	.006 (8.806)	-
Quality of accounting standards	-	-	-	-	-	-	.0003 (2.193)
Anti-director Rights	-	-.002 (-4.992)	-	-.004 (-8.409)	-	-.004 (-8.010)	-.001 (-2.571)
One Share/One Vote	-.030 (-17.566)	-.028 (-16.905)	-.033 (-18.172)	-.031 (-18.624)	-.029 (-16.844)	-.026 (-16.359)	-.026 (-15.240)
French Origin	-.002 (-2.551)	-.010 (-6.074)	.004 (4.350)	-.004 (-3.073)	-.001 (-1.394)	-.012 (-7.427)	-.002 (-1.069)
German Origin	-.016 (-15.338)	-.023 (-14.429)	-.014 (-12.829)	-.024 (-14.825)	-.017 (-16.313)	-.028 (-16.766)	-.014 (-4.868)
Scandinavian Origin	-.007 (-3.393)	-.011 (-5.335)	-.010 (-4.978)	-.017 (-8.112)	-.010 (-4.977)	-.018 (8.644)	-.006 (-2.645)
Intercept	.047 (19.625)	.058 (20.812)	-.020 (-3.017)	-.015 (-2.226)	-.0008 (-.098)	-.007 (-.864)	.033 (3.072)
Number of Obs.	1183	1183	1183	1183	1183	1183	1183
R-squared	.6541	.6629	.688	.705	.6653	.684	.659

Table 7. IPO Underpricing and Institutional Variables

The dependent variable is the average IPO underpricing reported by Loughran, Ritter and Rydqvist (1994), as updated by Ritter (1998). "One Share/One Vote" is a dummy variable, equal to 1 if the legal system of the country explicitly imposes that each share be given one and only one vote in the shareholders' meetings, and 0 otherwise. The "dummy a (b)" equals 1 only if in the IPO the offer price is fixed before (after) the acquisition of information and the allocation is discretionary. The "dummy c" equals 1 if in the IPO the offer price is fixed before the acquisition of information and the allocation is not discretionary. The "dummy e" equals 1 only in the presence of binding regulatory constraints (see Table 2 in Loughran *et al*., 1994). Heteroschedasticity-consistent t-statistics are reported underneath estimated coefficients.

Regressors	**1**	**2**	**3**	**4**
Judicial Efficiency	-	-	-.046 (-2.235)	-
Rule of Law	-	-	-	-.032 (-1.008)
Quality of Accounting Standards	-.014 (-2.510)	-.016 (-2.711)	-.010 (-1.280)	-.014 (-1.952)
Anti-director Rights	-	.053 (1.818)	.047 (1.710)	.046 (1.628)
Dummy a	.351 (3.654)	.358 (3.985)	.336 (3.728)	.340 (3.611)
Dummy b	.117 (1.354)	.034 (0.337)	.040 (0.405)	.026 (0.259)
Dummy c	.374 (2.997)	.339 (2.722)	.293 (2.104)	.316 (2.220)
Dummy e	.962 (12.408)	.951 (11.197)	.859 (9.070)	.840 (5.594)
Intercept	.980 (12.408)	1.005 (2.673)	1.058 (2.716)	1.215 (3.805)
Number of Obs.	31	31	31	31
R-squared	.650	.682	.719	.695

Table A1. Summary statistics: annualized total return in US dollars

(MSCI database)

Means and standard deviations of 21 developed market returns and the MSCI World Index based on the Morgan Stanley Capital International (MSCI) indices. Both arithmetic averages and geometric averages are reported. Both means and standard deviations are annualized. All returns are calculated in US dollar terms. The sample ends in December 1997.

Country	Start	Arithmetic Mean	Geometric Mean	Standard Deviation
Australia	Dec. 1969	0.116175	0.081915	0.254771
Austria	Dec. 1969	0.126054	0.104552	0.208528
Belgium	Dec. 1969	0.162244	0.144107	0.188166
Canada	Dec. 1969	0.114449	0.096902	0.184777
Denmark	Dec. 1969	0.15613	0.138203	0.187138
Finland	Dec. 1987	0.123295	0.087817	0.269022
France	Dec. 1969	0.143712	0.116292	0.23263
Germany	Dec. 1969	0.13828	0.117125	0.203308
Hong Kong	Dec. 1969	0.253576	0.176733	0.393785
Ireland	Dec. 1987	0.157509	0.137765	0.19727
Italy	Dec. 1969	0.101627	0.067145	0.264251
Japan	Dec. 1969	0.152168	0.125724	0.229169
Netherlands	Dec. 1969	0.172072	0.155465	0.177328
New Zealand	Dec. 1987	0.0848	0.059359	0.229727
Norway	Dec. 1969	0.159719	0.123478	0.267287
Singapore	Dec. 1969	0.16652	0.12339	0.29455
Spain	Dec. 1969	0.122955	0.097651	0.223739
Sweden	Dec. 1969	0.177117	0.151882	0.22143
Switzerland	Dec. 1969	0.154639	0.136138	0.189238
THE WORLD INDEX	Dec. 1969	0.123818	0.113287	0.141395
UK	Dec. 1969	0.158247	0.12898	0.245708
USA	Dec. 1969	0.129932	0.117932	0.151237

Table A2. Summary statistics: annualized total return in US dollars

(EMDB database)

Means and standard deviations of 23 developing market returns based on the International Finance Corporation (IFC) indices. Both arithmetic averages and geometric averages are reported. Both means and standard deviations are annualized. All returns are calculated in US dollar terms. The sample ends in December 1997.

Country	Start	Arithmetic Mean	Geometric Mean	Std. Dev.
Argentina	Dec. 1975	0.570996	0.223219	0.926169
Brazil	Dec. 1975	0.256053	0.103176	0.559935
Chile	Dec. 1975	0.316381	0.251109	0.367217
Colombia	Dec. 1984	0.325998	0.283338	0.294906
Greece	Dec. 1975	0.094367	0.042968	0.335367
India	Dec. 1975	0.159689	0.121978	0.27743
Indonesia	Dec. 1989	-0.05731	-0.12826	0.359189
Jordan	Dec. 1978	0.100307	0.086147	0.168448
Korea	Dec. 1975	0.116108	0.064359	0.324846
Malaysia	Dec. 1984	0.06475	0.021374	0.287542
Mexico	Dec. 1975	0.258584	0.155391	0.42939
Nigeria	Dec. 1984	0.198001	0.059495	0.501552
Pakistan	Dec. 1984	0.149294	0.116474	0.262756
Peru	Dec. 1992	0.258228	0.206751	0.325772
Philippines	Dec. 1984	0.291977	0.226115	0.365098
Portugal	Jan. 1986	0.302875	0.230936	0.397844
South Africa	Dec. 1992	0.170734	0.145587	0.224483
Sri Lanka	Dec. 1992	0.041413	0.001693	0.28621
Taiwan, China	Dec. 1984	0.288669	0.179019	0.476237
Thailand	Dec. 1975	0.125287	0.079641	0.297372
Turkey	Dec. 1986	0.44367	0.233191	0.683526
Venezuela	Dec. 1984	0.269171	0.156059	0.465471
Zimbabwe	Dec. 1975	0.124857	0.062843	0.350372

Table A3. Summary statistics – Enforcement Variables and Antidirector Rights Score (MSCI and EMDB databases)

Variable	Mean	Standard Deviation	Min.	Max.
Judicial Efficiency	8.311272	1.873544	3.25	10
Rule of Law	7.892043	2.281635	2.08	10
Corruption	7.688647	2.046631	2.92	10
Risk of Expropriation	8.674786	1.412053	5.22	9.98
Risk of Contract Repudiation	8.231078	1.618514	4.36	9.98
Accounting Standards	64.81173	10.03328	36	83
Antidirector Rights	2.979592	1.216035	0	5

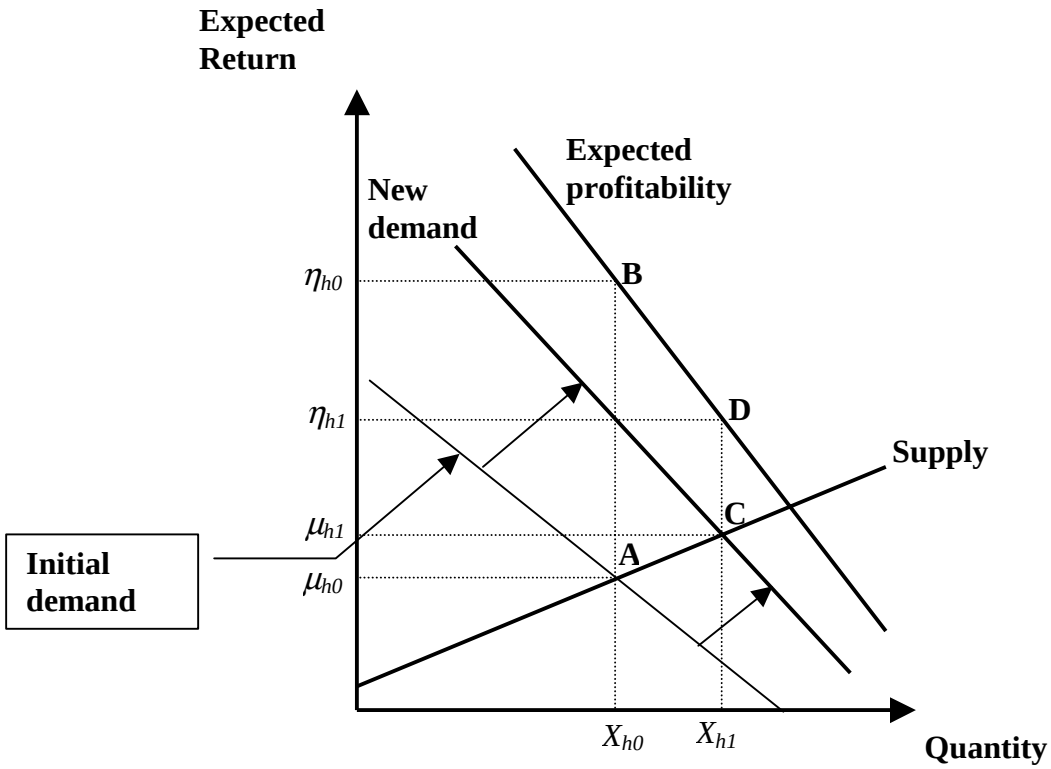

Figure 1: Reduction of Private Benefits under International Segmentation

This figure depicts the effects of an improvement in the legal system that reduces the fraction of the company's profits that the manager can divert. After this improvement, managers can credibly commit to return more resources to outside investors: the demand for funds schedule shifts outward and the observed equilibrium point shifts from A to C. The rate of return increases from μ_{h0} to μ_{h1}, while the cost of equity capital decreases from η_{h0} (point B) to η_{h1} (point D). The equilibrium amount of equity finance increases from X_{h0} to X_{h1}.

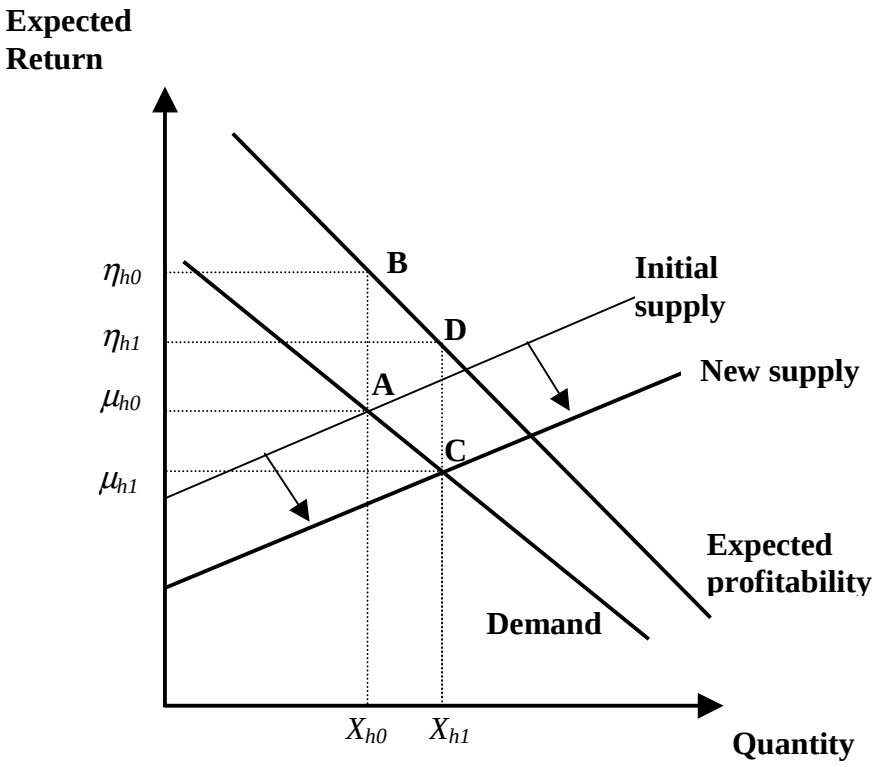

Figure 2: Reduction of Legal and Auditing Costs under International Segmentation

This figure shows the effects of a reduction in the legal and auditing costs that shareholder must bear to monitor managers. The investors' supply of funds schedule shifts downward and to the right, and the observed equilibrium point moves from A to C. The observed (expected) rate of return decreases from μ_{h0} to μ_{h1}, while the cost of equity capital to firms decreases, from η_{h0} (point B) to η_{h1} (point D). The equilibrium amount of equity finance increases from X_{h0} to X_{h1}.

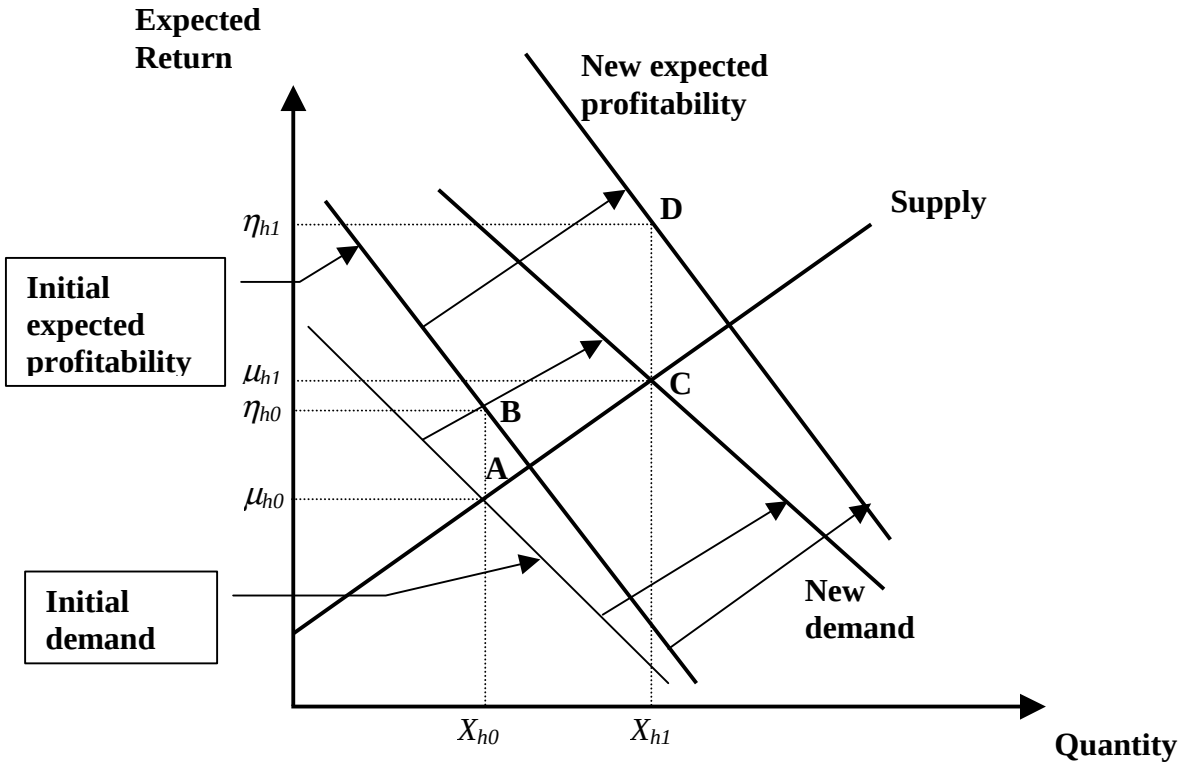

Figure 3: Increase in Profitability under International Segmentation

This figure shows the effects of an improvement of the legal environment which increases the marginal productivity of capital. This is captured by an outward shift of the expected profitability schedule. The associated increase in the demand for equity capital shifts the observed equilibrium point from A to C. The observed (expected) rate of return increases (from μ_{h0} to μ_{h1}). The cost of capital increases from η_{h0} (point B) to η_{h1} (point D). The equilibrium amount of equity finance increases from X_{h0} to X_{h1}.

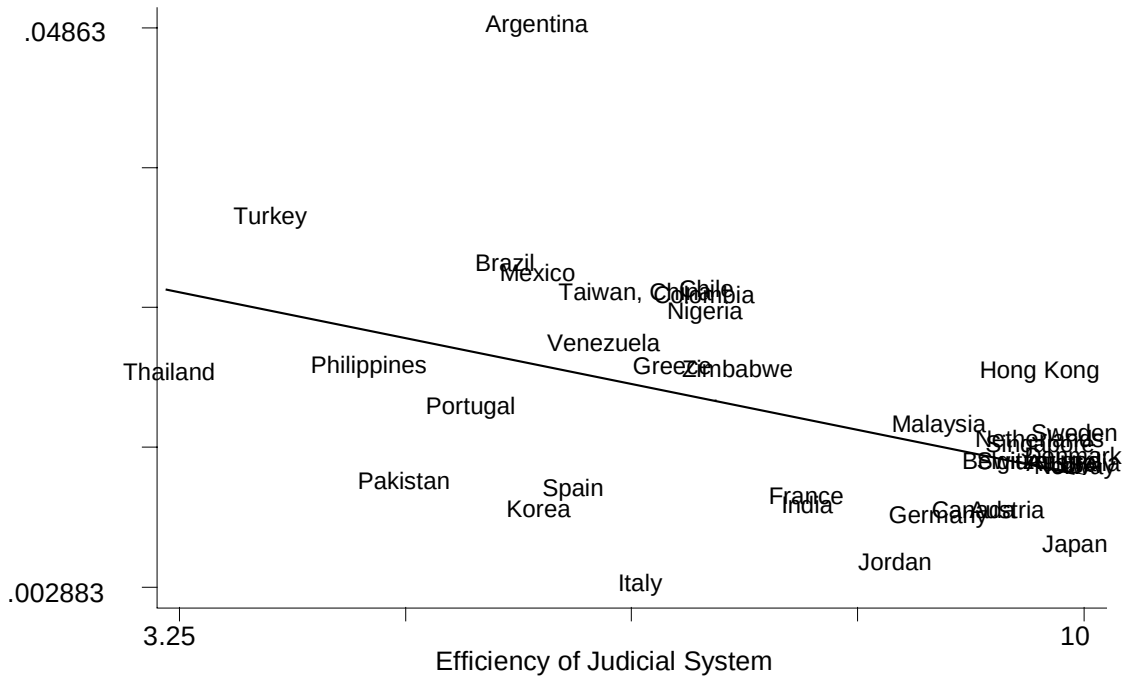

Figure 4: Returns Vs. Judicial Efficiency - All Countries 1987-1996

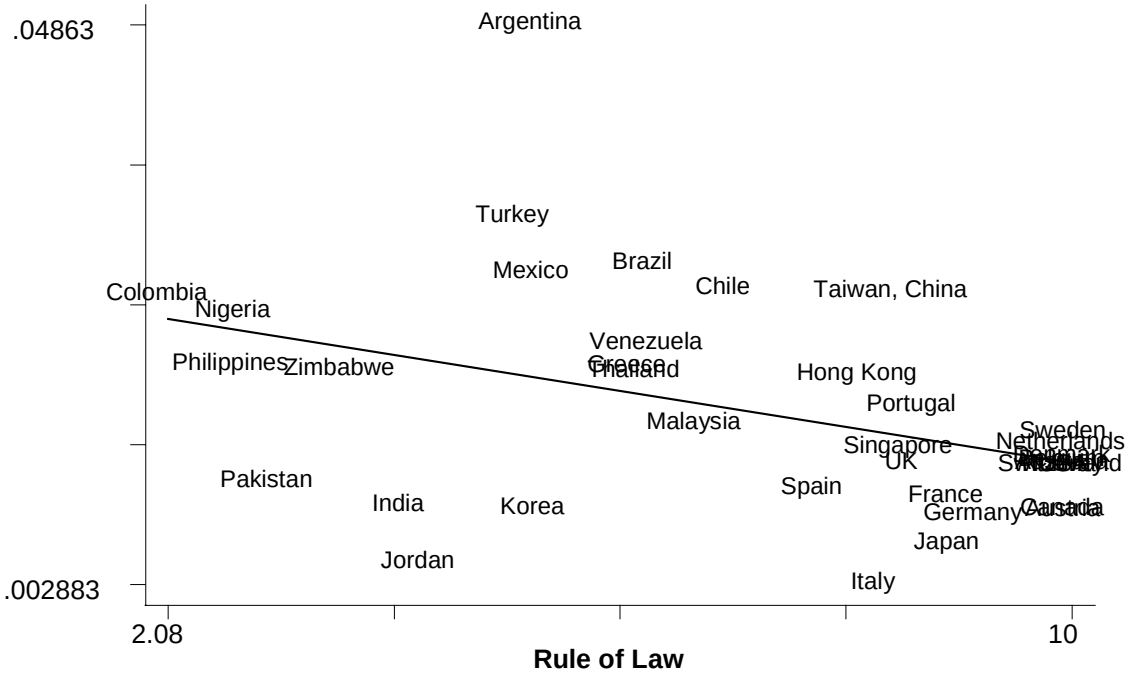

Figure 5: Returns Vs. Rule of Law - All Countries 1987-1996

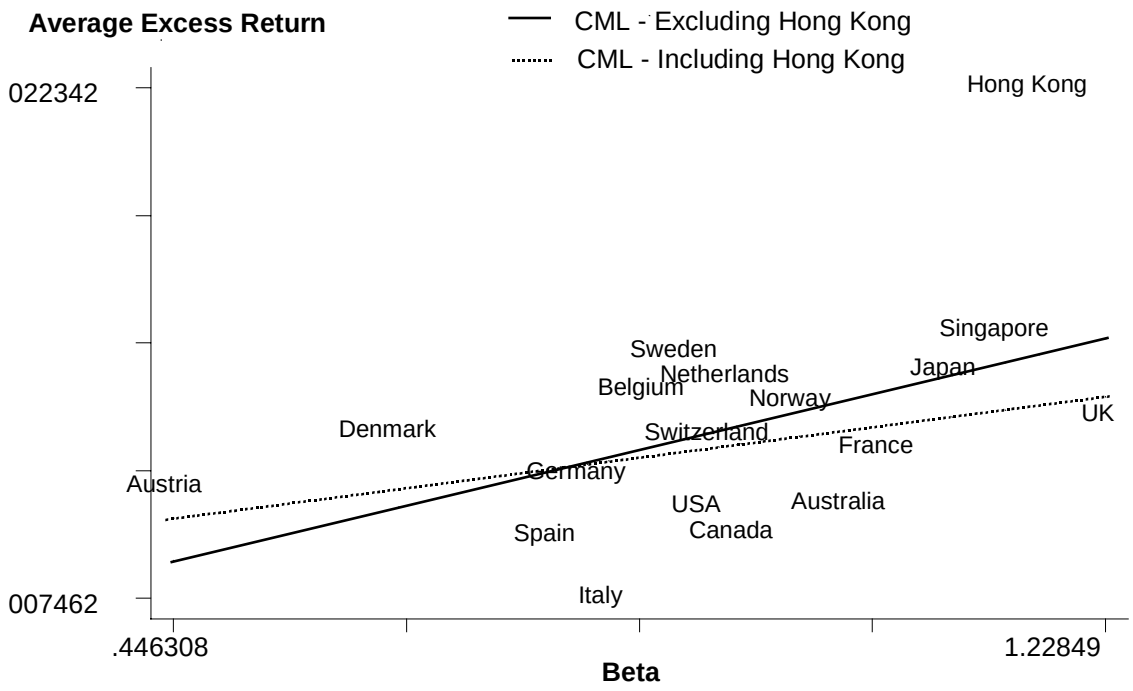

Figure 6: Capital Market Line - MSCI countries 1970-1996

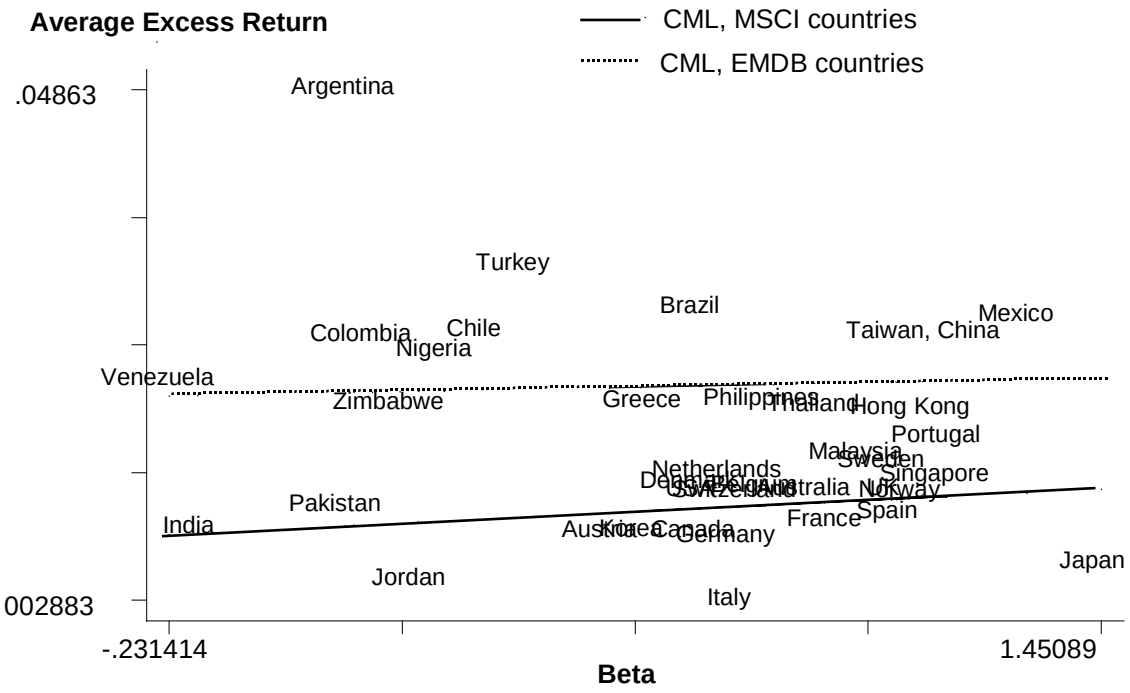

Figure 7: Capital Market Lines (CML) - All countries 1987-1996

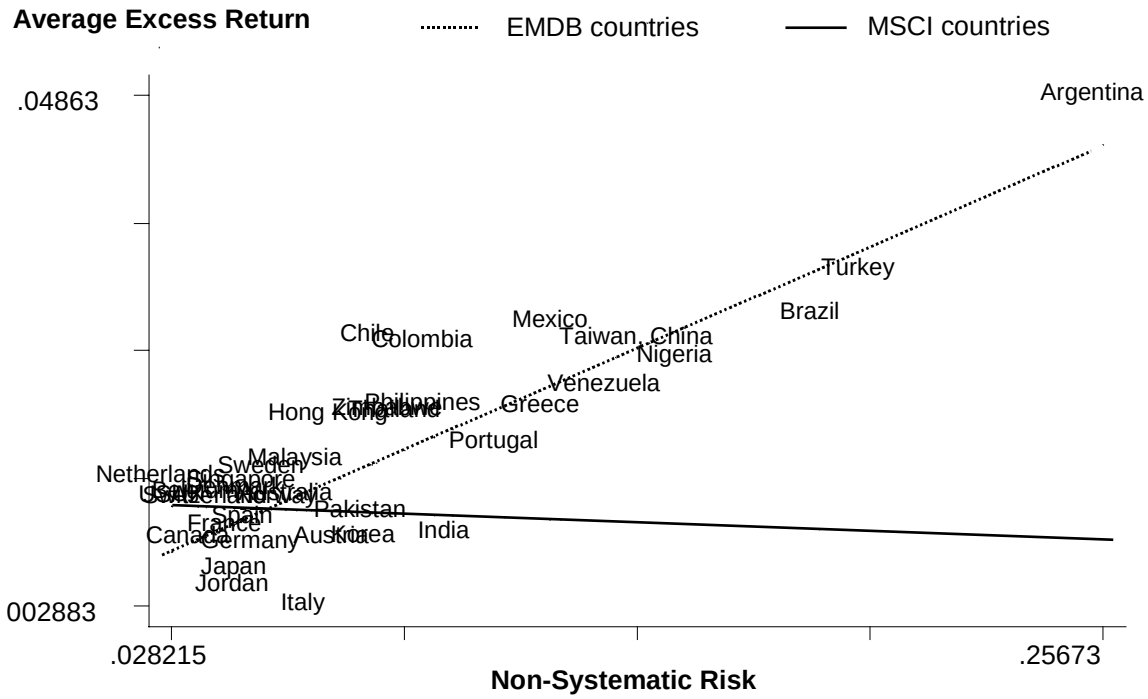

Figure 8: Returns vs. Non-Systematic Risk - All countries 1987-1996

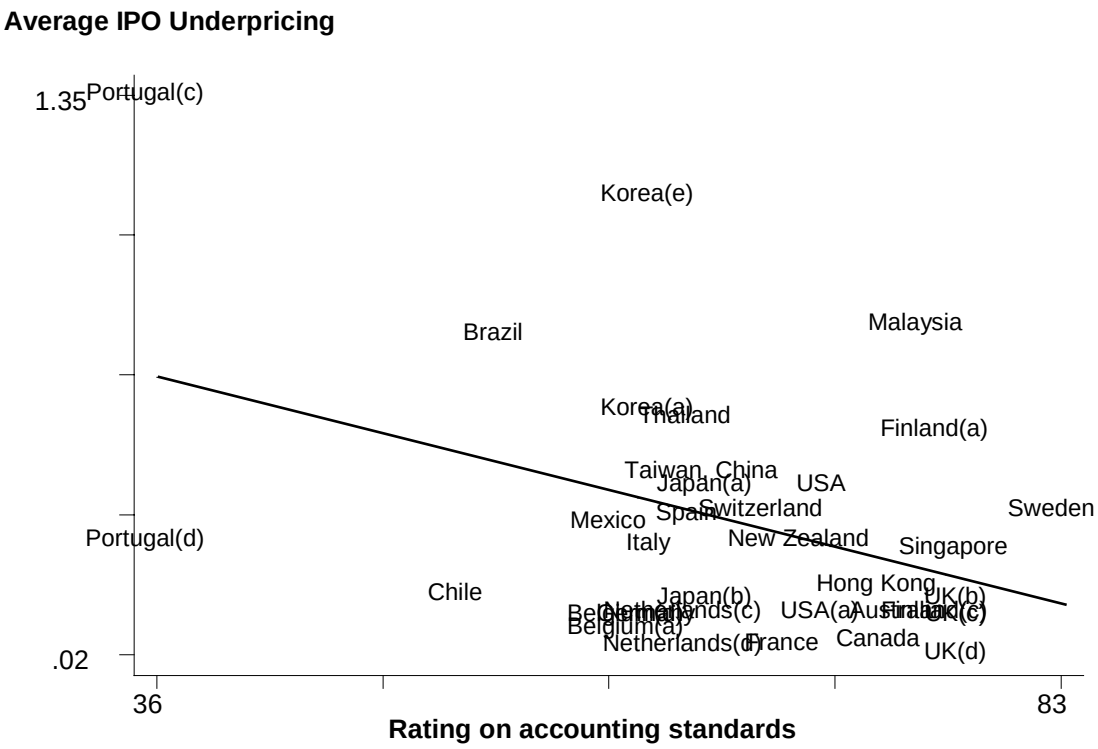

Figure 9: Average IPO Underpricing vs. Accounting Standards

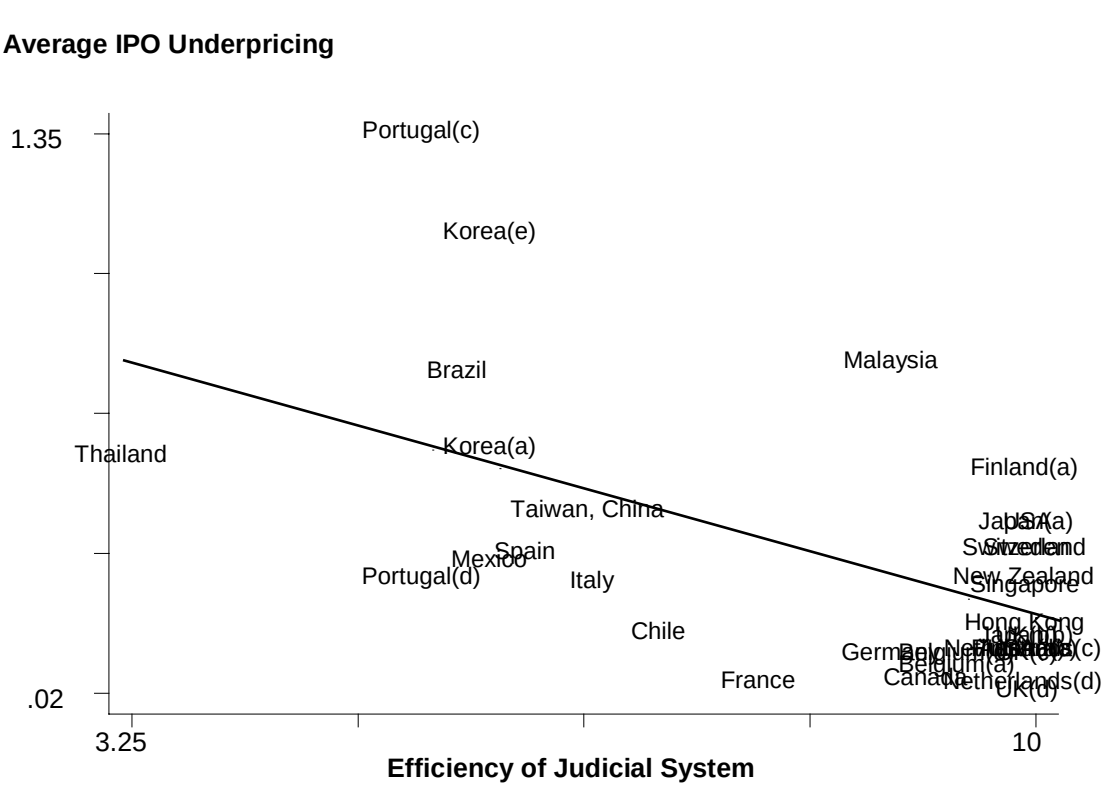

Figure 10: Average IPO Underpricing vs. Judicial Efficiency