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Capital Market Governance: How Do Security Laws Affect Market Performance?

Abstract

This paper examines the link between capital market governance (CMG) and several key measures of market performance. Using detailed data from individual stock exchanges, we develop a composite CMG index that captures three dimensions of security laws: the degree of earnings opacity, the enforcement of insider laws, and the effect of removing short-selling restrictions. We find that *improvements* in the CMG index are associated with *decreases* in the cost-of-equity capital (both implied and realized), *increases* in market liquidity (trading volume, market depth, and U.S. foreign investments), and *increases* in market pricing efficiency (reduced price synchronicity and IPO underpricing). The results are quite consistent across individual components of CMG and over alternative market performance measures.

1. Introduction

In an increasingly integrated global economy, interest in (and awareness of) good capital market regulation is on the rise. While presumption of the damaging effects of bad market governance is widespread, direct evidence on its economic consequences has been more difficult to document. Contributing to this problem is the elusive nature of governance. Because the quality of capital market governance can be associated with a number of other country-level phenomena, its direct impact on the performance of stock markets may be difficult to isolate.

In this paper, we examine how capital market regulations and their enforcement might affect a wide range of market performance measures. We focus on exchange-based (or market-related) regulations, and coin the term *capital market governance* (CMG) to describe this aspect of a country's regulatory environment. Using detailed data collected from individual exchanges for the period 1969-1998, we construct a composite CMG index that varies over time, thus reflecting inter-temporal variations in the quality of market governance in each country. We then examine the relation between changes in the CMG index and changes in market performance across countries.

Our study consists of two-stages. In the first stage, we use a unique data set gleaned from market regulators, exchange officials, and industry contacts, to construct a broad index of capital market governance. Specifically, we exploit innovations developed in several recent studies to measure three dimensions of capital market governance: (1) a composite earnings opacity measure, (2) insider trading laws and their enforcement, and (3) relaxation of short-selling restrictions. Figure 1 provides an overview of these market governance variables.

In the second stage, we evaluate the impact of CMG on key dimensions of market performance. Specifically, we use seven empirical proxies to capture three aspects of market performance: (1) *Cost-of-capital* (both implied and realized); (2) *Market liquidity* (including trading volume, market depth, and foreign ownership by U.S. investors); and

Pricing efficiency (including price synchronicity and IPO underpricing). Figure 2 offers an overview of these performance measures and our empirical proxies.

Our goal is to gain an overarching perspective on how changes in security laws can affect the returns shareholders demand, their willingness to trade, and the efficiency with which prices incorporate information. Securities laws cover a wide spectrum of areas, including the distribution of securities, takeovers, stock market manipulations, insider trading, stock exchanges, and the activities of financial intermediaries. We focus on three aspects of these regulations: earnings opacity, insider laws, and short-selling restrictions. We examine how these laws individually affect a wide set of market performance metrics, and we evaluate their combined effect using a CMG index.

A distinguishing feature of this study is the range of market performance measures we examine. Prior studies have typically focused on the effect of individual laws on one or two aspects of market performance – e.g., the role of accounting disclosure laws on the cost-of-capital. However, regulatory decisions can hinge on potential trade-offs across different market performance metrics (e.g., the trade-off between pricing efficiency and market liquidity in the insider trading law debates). From a policy perspective, it is important to know how regulatory changes might affect multiple aspects of market performance.[1]

Our strategy is to examine several key dimensions of market performance, using multiple empirical proxies for each. For example, in estimating changes in the cost-of-capital, we use both an implied approach based on discounted cash flow models (Bekaert and Harvey (2000); Lee, Ng, and Swaminathan (2003)), and a more traditional international asset pricing approach based on realized returns. In measuring market liquidity, we examine changes in trading volume, market depth (volume scaled by volatility), as well as U.S. foreign investment. Finally, in examining pricing efficiency, we use both a Morck et al. (2000) synchronicity measure, and a measure of the degree of underpricing in IPO

[1] Our use of a composite CMG measure might also enhance the power of our tests. For example, in assessing the potential impact of security laws on a country's cost-of-capital, it seems sensible to use a composite measure of these laws rather than a variable that just reflects a single regulation.

offerings. While none of these individual proxies might fully capture the underlying economic construct, the consistency of our results across multiple methods adds to their interpretability.

To deal with the empirical challenge posed by country-level correlated omitted variables, we designed our tests to capture *inter-temporal changes* in a country's securities laws. By estimating most of our models with fixed-country effects, we use each country as its own control. We are thus able to isolate inter-temporal fluctuations in the CMG index, and evaluate the effect of *changes* in a country's CMG index on *changes* in its cost-of-equity, market liquidity and pricing efficiency over time.[2]

We find that after controlling for other factors, improvements in the CMG index are associated with economically significant decreases in the cost-of-equity capital. The estimated economic magnitude of the effect is similar across the two cost-of-capital measures – using the implied estimation method, the cost of equity decreases by 2.6% per standard deviation increase in CMG; using the average realized returns from an international asset pricing model, the effect is 2.9% per standard deviation increase in CMG. While not all three components of the CMG index are individually significant in every regression specification, the directional inferences are always the same: improvements in earnings opacity, insider trading, and short-selling laws result in lower costs of capital.

In addition, we find that improvements in the CMG index are positively correlated with three measures of market liquidity. Specifically, improved CMG is associated with *increases* in trading volume, market depth (i.e., volume divided by volatility), as well as the level of U.S. stockholdings (suggesting that countries with improving governance laws attract more U.S. investors). Once again, all three components of the CMG index contribute to these overall results. The directional inferences are consistent for the

[2] We conduct country fixed-effect regressions whenever data permit. Specifically, all tests involving the cost-of-capital (both implied and realized) and market liquidity (both trading volume and market depth) are estimated with country fixed-effect regressions. The pricing efficiency tests (price synchronicity and IPO underpricing) and the U.S. foreign investment test are based on cross-sectional regressions.

earnings opacity, insider trading, and short-selling variables, even when each is individually included in the same regression.

Finally, we find that the CMG index is negatively correlated with pricing synchronicity (Morck et al. (2000)) and the amount of IPO underpricing, after controlling for a host of other factors. These results suggest that improved CMG increases pricing efficiency. Detailed analysis indicates that the pricing efficiency results are driven primarily by the insider trading and short selling variables, with earnings opacity playing a lesser role.

Overall, our findings support the view that improved capital market governance is associated with lower costs-of-equity capital, increased market liquidity, improved price efficiency, and increased stock ownership by U.S. investors. We find little evidence that the improvements in each of the three market performance attributes come at the expense of the other two. To the extent that market regulators find the directional changes we document desirable, the prescriptive implications are unambiguous.

2. Capital Market Governance and Equity Market Characteristics

Capital market governance refers to the set of laws, rules, and regulations that govern the functioning of capital markets. More importantly, it is the degree of enforcement of those laws, rules and regulations.

The capital market governance measures we construct are aimed at capturing different facets of the interaction between insiders and outsiders of the corporations. Corporate insiders have an informational advantage that they can potentially exploit to the harm of ordinary investors. A key prediction from the agency theory literature is that in equilibrium, outsiders will factor in these agency problems and make the insiders bear the cost. We posit that these costs will translate into higher costs of equity, as well as possibly lower market liquidity, and lower pricing efficiency.

Each of our capital market governance measures is designed to track a distinct aspect of regulatory protection of investors from insider activities. Insider trading laws and their

enforcement is the most direct expression of this type of protection. Similarly, our measure of accounting opacity captures the extent to which insiders might secure an unfair informational advantage over outsiders. Finally, short selling prohibitions increase the risk to outsiders, because they allow corporate values to be potentially overvalued, thus further increasing informational asymmetry between insiders and outsiders.

2.1 Insider trading enforcement

The first capital market governance measure we use is the enforcement of insider trading laws. Scores of law, economics and finance papers have argued the pros and cons of insider trading regulations. Bainbridge (1998), besides providing a comprehensive list of papers that have discussed insider trading, succinctly summarizes the arguments for and against allowing insider trading. Briefly stated, in stock markets where insiders trade with impunity, liquidity providers would protect themselves by increasing their ask price and decreasing their bid price. This increases transaction costs, leading to lower market liquidity, and a higher required rate of return on equity. These transaction costs are not diversified away in equilibrium even in well-integrated global markets (see Lombardo and Pagano (2000) and Lee and Ng (2004)).

A second reason the cost of equity might be higher in markets with weak insider trading laws is that in such markets, large controlling shareholders are more easily tempted by management to profit from stock tips, rather than from effort-intensive monitoring. Knowing this, ordinary shareholders would again demand a higher return on equity. In short, the first reason predicts a higher cost of equity because of an implicit transaction tax inherent in high bid-ask spreads, while the second reason does not depend on an illiquidity premium argument.[3]

The directional effect of insider trading enforcement on market efficiency is less clear. Restricting insider trading may decrease information flow and decrease the ability of markets to price assets quickly and efficiently. On the other hand, when insider trading

[3] An argument can also be made that the cost of equity is lower in markets where insiders trade freely (e.g., Manne (1966)). However, the weight of the evidence appears to suggest otherwise (e.g., Bhattacharya and Daouk (2002)).

enforcement is more effective, analysts and other investors have greater incentives to analyze firms, which might lead to better market efficiency.

Our measure of insider trading is based on enforcement of insider trading laws from Bhattacharya and Daouk (2002). Bhattacharya, et al. (2000) had shown that it is the enforcement rather than the existence of insider trading laws that deter insiders. In our empirical setup, the insider trading variable is assigned a value of 10 if there had been any enforcement, and zero otherwise.

2.2 Earnings Opacity

The second measure of governance we use is earnings opacity. Our earnings opacity measure is based on the methodology in Bhattacharya, Daouk, and Welker (BDW; 2003). Briefly, we define earnings opacity as the extent to which the distribution of reported earnings of firms in that country fails to provide information about the distribution of the true, but unobservable, economic earnings (see Appendix A for details).

In their call for more research on the relation between accounting information and governance, Bushman and Smith (2001) identify three channels by which earnings opacity may affect financial markets. First, better accounting information helps investors distinguish between good and bad investments, thus lowering estimation risk and leading to lower costs of equity and higher pricing efficiency. Second, better accounting information helps investors distinguish between good and bad managers, thus decreasing agency costs, and lowering firms' cost of equity.

Third, earnings opacity, by weakening the link between reported earnings and unobservable economic earnings, increases asymmetric information. An increase in asymmetric information leads to an increase in the adverse selection problem a liquidity provider faces when trading with insiders. Liquidity providers in such a market would seek to protect themselves by increasing their ask price and decreasing their bid price. The increased transaction costs in turn result in higher required rates of return on equity,

and lower market liquidity (see Glosten and Milgrom (1985), Kyle (1985), Amihud and Mendelson (1986), Jacoby, et al. (2000), and Brennan and Subramanyam (1996)).

Following BDW (2003), we infer a country's general level of earnings opacity from the distributional properties of its reported earnings. Specifically, our opacity measure is designed to capture three aspects of reported earnings: earnings aggressiveness, loss avoidance, and earnings smoothing (see appendix A). We construct a panel data set for each of these three measures and then average them to obtain an overall earnings opacity time-series measure per country. This variable ranges from zero (most opaque) to ten (least opaque).

2.3 Short selling constraints

Although the directional effect of short-selling constraints on market valuation is less clear, the preponderance of the theoretical and empirical evidence seems to suggest that increased short selling constraints is associated with less efficient price discovery, lower market liquidity, and higher costs of capital.

The earliest theoretical work on this topic is Miller (1977). Under heterogeneous expectations, when short-selling constraints are binding, Miller showed that stock prices will be overvalued because they reflect only the bullish views. Also, short selling constraints impedes price discovery and potentially lowers market liquidity.

Short selling constraints can also affect the cost of equity through its potential effect on return skewness and volatility. Theoretical models suggest short-selling restrictions will give rise to greater negative skewness in returns. To the extent that investors are averse to negative skewness, they will demand a higher rate of return. At the same time, increased short-selling constraints are associated with higher return volatility. Higher return volatility could increase cost of equity if international markets are not fully integrated. Empirically, Charoenrook and Daouk (2003) provide evidence that short-selling restrictions are indeed associated with lower market liquidity. In addition, Bris, Goetzmann and Zhu (2004) find that short-selling restriction in a country tends to be

associated with lower pricing efficiency. In sum, the weight of the evidence suggests that increased short selling constraints will adversely affect market liquidity and pricing efficiency, and result in higher costs of capital. Thus, we construct our CMG index such that decreases in short-selling constraints are reflected as improvements in the index.

Our measure of short selling restrictions is based on a survey of exchange officials by Charoenrook and Daouk (2003). They ask in their survey the first date where short selling became feasible. Also, they ask about the existence of put options on stocks, because equity put options offer an alternative method to implement a short position. In our empirical tests, the insider trading variable is zero if short selling was not allowed and put options do not exist in a given time period, and 10 if short selling is allowed *or* put options exist.

After we compute the measures of insider trading, earning opacity, and short selling restrictions, we compute the simple average of the three measures to form the CMG index. This measure ranges from 0 (worst governance) to 10 (best governance).

2.4 Relation to Other Studies

Some other studies conduct in-depth case study on the issue of governance in a particular market. For example, Black, Jang and Kim (2005) conduct an in-depth country case study of the factors that predict governance levels for both large and small Korean firms. On the other hand, our study is in a stream of literature that adopts a multi-country approach. At least two recent studies have also focused on the relation between market-based regulations and equity markets. In this section, we discuss the distinctive features of our study relative to other concurrent projects.

La Porta et al. (2002) conducts a detailed analysis of how securities laws affect the issue of new equity to the public. Their focus is on the agency problem between prospective investors in an initial public offering (IPO) and the "promoter" who offers shares for sale. Their data allows them to evaluate the efficacy of specific types of securities laws, but their focus is primarily on laws governing the IPO process. Using the disclosure

requirement and enforcement indices developed by La Porta et al. (2002), Hail and Leuz (2003) examine the effect of securities regulation and legal institutions on firms' implied cost of capital. Both studies conclude that more extensive securities regulation yield beneficial results for security markets, such as lower levels of cost of capital.

Our study is similar in spirit to these two papers. However, we use a unique set of capital market governance metrics and examine a much wider range of market performance metrics. Our earnings opacity measure captures three different dimensions of a country's accounting system, and allows these dimensions to vary over time. Similarly our insider-law and short-selling restriction measures identify not only countries with superior laws, but also the timing of the enforcement of these laws. These research design innovations allow us to examine the effect of *changes* in governance not only on the implied cost of capital, but also the average realized returns.

In addition, our study allows us to evaluate the effect of capital market governance on *multiple* dimensions of market performance. Market regulators are understandably concerned about the effect of securities laws on many different aspects of performance. For example, regulations that lower the cost of capital might have adverse effects on market liquidity or pricing efficiency. To our knowledge, we are the first study to examine how securities laws affect a wide range of market performance metrics. Our approach allows regulators to evaluate potential trade-offs in performance within a consistent research framework.

3. Market Performance Measures

As Figure 2 shows, the dependent variables for our analysis can be broadly categorized into three groups: (1) two measures of the cost of equity, (2) market liquidity (including trading volume, market depth, and foreign U.S. investments), and (3) pricing efficiency (including price synchronicity and IPO underpricing). In this section, we discuss each of these measures in detail.

3.1 Cost of equity measures

The cost of equity in a country is defined as the return shareholders require for holding shares in that country. This is an expectations variable, which must be proxied for using observable data. We employ two approaches: a price implied cost-of-capital, and average realized returns.

3.1.1 The Implied Approach

The first approach is to compute the cost of equity by backing it out from the classical constant growth dividend discount model. Appendix A in Bekaert and Harvey (2000) explores in great detail the relation between dividend yields and the cost of equity for many models. Assuming that the best forecast for future growth rates in dividends is the most current dividend growth rate, which implies that we assume that dividend growth rates follow a random walk, it follows that the estimated cost of equity = current dividend yield × (1 + current growth rate of dividends) + current growth rate of dividends.

We use dividend yields to measure cost of equity because these yields are observable, stable, and stationary. In general, a sharp change in cost of equity should lead to a sharp change in dividend yields. A disadvantage of using dividend yields is that changes in dividend yields may come about because of repurchases of stock. However, this problem should be small in emerging markets because repurchases are minor.[4]

3.1.2 The International Asset Pricing Approach

The second approach to estimating the cost of equity using realized returns while explicitly accounting for risk. We adopt a simplified version of Bekaert and Harvey (1995) as our international asset pricing model. Their empirical specification allows for partial integration of a country to the world equity markets. Their model is appealing because it permits a country to evolve from a developing segmented market (where risk is measured by the country's variance) to a developed country which is integrated to world

[4] Another approach to estimating the implied cost-of-capital is to incorporate analyst forecasts of earnings (e.g., Lee, Ng, and Swaminathan (2003) and Hail and Leuz (2003)). While the use of forecasted earnings might lead to increased precision, our technique does not require firms to have analyst coverage. Because our analysis is at the country-level (i.e. not firm level), these techniques are likely to yield similar results.

equity markets (where risk is measured by the sensitivity of a country's equity returns to movements in the world market portfolio). The special case of complete integration, where the world factor is the only factor, is nested in their model. We describe the details of this asset pricing model, and our estimation procedure in Appendix B.

3.2 Market Liquidity Measures

We are also interested in how CMG affects market liquidity. A simple measure of market liquidity is trading volume. However, volume alone does not fully capture the concept we have in mind, particularly if increased volume comes at the expense of increased volatility. We therefore use several different measures, including market depth (volume divided by volatility) and the amount of U.S. foreign investment.

3.2.1 Trading Volume

We use the rate of turnover in a market to measure trading volume. Specifically, our volume measure is defined as the ratio of volume of dollar trade per month to the dollar market capitalization at the end of the month. To mitigate the effect of outliers, which occur because the denominator is small in some countries, we take the natural logarithm of this ratio.

3.2.2 Market Depth

While trading volume is the lifeblood of markets, it is not necessarily the best measure of market quality. This is because, from an investor's perspective, increased volume does not necessarily translate into increased market liquidity. The notion of market liquidity is related to how much trading can be done without adversely affecting prices (i.e. how much trading can be accomplished with minimal price impact). Unfortunately, increased volume is generally accompanied by increased volatility, so higher trading volume alone is insufficient evidence that market depth has increased.

A better measure of market depth, or liquidity, is volume turnover scaled by return volatility (e.g., Amihud (2002)). This variable captures the quantity of trading per unit of volatility, and is closer to the notion of market quality investors are most concerned about. Moreover, Hasbrouck (2003) finds that the Amihud (2002) variable is the best

among the non-intraday measures of price impact costs. We construct two versions of the market depth variable. In the first, we use the ratio of trading volume (see section 3.2.1 above) to the standard deviation of daily returns computed each month. In the second, we use the ratio of trading volume to the absolute value of the monthly returns.[5]

3.2.3 U.S. foreign stockholdings

A liquid market is also characterized by a breadth of ownership, in particular by foreign investors. We construct a measure that examines US citizens' stockholding in a country relative to what the US holdings would have been based on the country's market capitalization. If an investor wishes to be fully diversified across different countries, (s)he should hold a portfolio of country indices whose weights are in proportion to the market capitalization of those countries. In reality, the actual holdings of US investors can differ sharply from these theoretic weights.

We compute a measure that captures this difference. Specifically, we use the ratio of the percentage of US stockholdings in each country to the percentage of the market capitalization of the country. To mitigate the effect of outliers, we take the natural logarithm of this ratio. In other words, we use:

$$US\_hold_i = \ln\left(\frac{h_i / \sum_{j=1}^{N} h_j}{cap_i / \sum_{j=1}^{N} cap_j}\right)$$

where h_i is US stockholding in dollars in country i and cap_i is market capitalization of country i in dollars where N is the number of countries in the world.

This variable captures the over (under) weighting in shareholdings by U.S. investors for each country, relative to that country's weight in a global index. We conjecture that U.S. investors (who are not constrained to buy stocks from any countries) are less inclined to

[5] We also used the conditional volatility of monthly returns computed from the multivariate ARCH model used in the International Asset Pricing Model described above. The results are similar and are not reported.

hold stocks in markets with lower CMG scores.

In constructing this variable, we use data on foreign stockholdings by US citizens from Bhattacharya and Groznik (2003). The data is based on a survey carried out by the U.S. Treasury Department and the Board of Governors of the Federal Reserve System (also see Ahearne, Griever and Warnock (2001)). Market capitalization in dollars is from Datastream.

3.3 Pricing Efficiency Measures

In addition to the cost-of-capital and market liquidity, market regulators are also interested in the effect of security laws on markets' ability to efficiently price stocks and process new information. We use two empirical proxies suggested by the ex ante literature.

3.3.1 Price Synchronicity

In an interesting study, Morck, Yeung and Yu (2000) argue that in more price efficient markets, stocks will exhibit higher average idiosyncratic risk. According to this argument, the ratio of firm-specific information to market-level information should be higher in informational environments that allow market participants to acquire information, and act quickly and inexpensively upon it. Therefore, Morck et al. (2000) nominate stock synchronicity as a measure of the overall price efficiency of the market.

Following their definition, we compute this variable as the average R^2 from firm-level regressions of bi-weekly stock returns on local and U.S. market indices in each country. Countries with higher average R^2 (higher price synchronicity) are deemed to be less price efficient. Given our overall research design, we examine how the CMG variables, both collectively and individually, affect a country's price synchronicity.

3.3.2 IPO Underpricing

IPO underpricing refers to the frequent incidence of large initial returns accruing to investors in IPOs of common stock. We use average IPO first-day returns from Professor Jay Ritter's web site (http://bear.cba.ufl.edu/ritter/) for 38 countries. The range in

average first-day returns vary greatly, from China at 257% to Denmark at only 5%. The prior research has linked IPO underpricing to various agency problems including information asymmetry and corruption (see Loughran, Ritter, and Rydqvist (1994) and Ritter and Welch (2002) for a summary of this literature). Generally, greater underpricing is associated with high pricing inefficiencies. To the extent improved governance will reduce these types of agency problems, we expect an increased CMG to reduce IPO underpricing.

Note that although we treat IPO underpricing as a price discovery problem, it can also be regarded as part of the cost of capital analysis. IPO is a way for entrepreneurs to raise capital for their enterprise. The larger the underpricing, the less money the entrepreneur receives for selling claims to outside investors. This is equivalent to an increased cost of raising capital for existing shareholders.

4. Data Description and Sample Selection

Data on monthly equity indices of 22 developed countries were obtained from Morgan Stanley Capital International (MSCI). Data on monthly equity indices of 10 emerging markets were obtained from International Financial Corporation (IFC). The data are from December 1969 to December 1998 (some countries do not have data for the full time period).

We use the MSCI value-weighted World Index as a proxy for the world market portfolio. Monthly returns of each country's stock market and the world market portfolio are computed from these indices. We obtain monthly data on dividend yields for the 32 countries based on Datastream indices. We obtain monthly data on the volume of trade and market capitalization from Datastream (this data was available for 29 of the 32 countries in our sample).

Bekaert and Harvey (1997) divide the sum of exports and imports by the country's gross domestic product to obtain a variable that captures the level of integration of a country with the rest of the world. This is because the level of globalization affects the cost of

equity (see Stulz (1999a)). We follow the same procedure. Monthly data on exports and imports for the 32 countries were obtained from the International Financial Statistics provided by the International Monetary Fund.

As purchasing power parity is not observed in the data, standard international asset pricing models like Ferson and Harvey (1993) and Dumas and Solnik (1995) have a foreign exchange factor (FX factor). We include this control in our international asset pricing factor model as well. Monthly data on foreign exchange rates are obtained from the International Financial Statistics.

We also control for the confounding effect of market liberalization. When a country opens its capital markets to foreigners, its cost of equity is expected to be reduced through improved risk-sharing and better corporate governance (Stulz (1999b)). Bekaert and Harvey (2000) and Henry (2000) empirically confirm that market liberalization activities do reduce a country's cost of equity. To control for this phenomenon, we use official liberalization dates from Bekaert and Harvey (2000).

Finally, we use several variables as controls for the level of corporate governance and protection of minority shareholder rights in different countries. Klapper and Love (2004) showed that better corporate governance is highly correlated with better performance in many emerging markets. Following La Porta et al. (1998), we use a measure of the efficacy of the judicial system (Judsys), ranging from 0 (least efficient) to 10 (most efficient). Antidir is an aggregate index developed by La Porta et al. (1998) to capture shareholder rights within a country. Acctstand is a crude measure of the quality of financial reporting in a country, based on the inclusion or omission of 90 items in seven categories. We also use binary variables that represent the legal origin of the different countries (English, French, German and Scandinavian legal regime).

5. Empirical Analysis

5.1 Descriptive statistics

Table I presents the countries in our dataset in alphabetical order. Each country is associated with values of the components of the CMG index. The values associated with "Short Selling" and "Put Options" represent the date each was first feasible in a given country. The "Insider Trading Enforcement" column reports the date of the first enforcement action against an insider for trading violations. Also, table I shows for each country, average liquidity, depth, efficiency and cost of equity measures.

<Insert Table I here>

The "Earnings Opacity" score is the average of three earnings opacity decile rankings. To construct this number, we rank each country-month into deciles on each of three opacity measures (earning aggressiveness, loss aversion, and income smoothing). We then take the average of these three rankings in computing an opacity index. Table values represent the monthly average index value for each country. Higher scores indicate lower opacity (i.e. greater transparency).

Table II ranks countries by the quality of each component of the CMG index, in descending order. In constructing the short-selling ranking, we took the earlier of either the date of the relaxation of short-selling constraints, or the date that put options are allowed into a market. Also reported in this table is the rank of each country according to the CMG index itself. As can be seen, the top five countries in terms of quality of capital market governance are United States, Brazil, Canada, France, and the U. K., respectively. The bottom three countries are India, Greece, and Pakistan, respectively. Most of the countries that score high on the CMG index are European or American countries. However, Taiwan, Singapore, and Japan, also count among the top ten. Having the largest market capitalization in Latin America, Brazil also enjoys a high CMG score due

to its long-standing insider trading law enforcement, feasibility of short selling and relatively good earning opacity score.

<Insert Table II here>

5.2 Does capital market governance affect stock markets?

Our main empirical tests explore the effect of capital market governance on several dimensions of market performance – the cost of capital, market liquidity, and pricing efficiency. This section reports our results.

As a preliminary exploration, we plot the time series of CMG, liquidity, and cost of equity measures averaged over all countries. This is shown in figure 3. We normalize all three time series to have a value of one in 1992. This is arbitrary. However, it allows us to have all three series with the same scale. As can be seen, CMG and liquidity seem to exhibit an upward trend. On the other hand, cost of equity seems to show a downward trend. This is an early indication that CMG has improved over the years, potentially increasing liquidity and reducing cost of equity.

<Insert Figure 3 here>

5.2.1 Cost of equity

We first explore the effect of capital market governance on the cost of equity. Using the dividend yield-based measure of cost of equity as the dependent variable, we run five panel time-series regressions with country-fixed effects. Model 1 uses CMG as the independent variable. Models 2 to 4 use each one component of CMG as the independent variable. Model 5 uses all three components of CMG as the independent variables. All models control for liberalization, liquidity risk (Brennan and Subrahmanyam (1996))[6], and foreign exchange risk (Ferson and Harvey (1993), Dumas and Solnik (1995))[7]. The

[6] The proxy for liquidity risk is turnover. Turnover is the ratio of volume of trade to market capitalization. We take the natural logarithm of this ratio for reasons mentioned before.

[7] Because of convergence problems, our estimation is a two-step procedure. In the first step we strip out the effects of the local variance factor and the world factor, and in the second step, to isolate the effect of

panel regressions use data for the 32 countries for which we have dividend yield data from January 1986 to December 1998 (some countries do not have data for the full time period). We correct for country-specific heteroskedasticity and country-specific autocorrelation.

Table III presents the results from these panel time-series regressions. In model 1, the coefficient for the CMG variable is negative and statistically significant at the one percent level. This is consistent with our hypothesis that improved capital market governance lowers the cost of equity. The association is also economically significant. An increase in CMG of one standard deviation is associated with a 2.6 percent decrease in the cost of equity.[8] The coefficient on the currency risk has the right sign, but is not significantly different from zero at conventional levels. The liberalization indicator has the correct negative sign, but is not significantly different from zero at conventional levels. The liquidity variable has the correct negative sign, but is also not significantly different from zero. The results from models 2 to 5 are broadly consistent with our conclusion. Each of the three components of CMG is significant and of the correct sign when included on its own. When all components are included together, they are still of the correct sign, although only earnings opacity remains significant.

<Insert Table III here>

We also compute a cost of capital measure based on realized returns using non-linear least squares. The results are reported in Panel A of Table IV.

<Insert Table IV here>

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earnings opacity, we strip out the effects of other factors like the FX factor. The FX factor that we use is the conditional covariance of the return of the stock market index of the country with the return a U.S. investor would receive if she held the foreign currency. This conditional covariance is obtained by using the multivariate ARCH model we previously discussed in equation (2) – just replace the world portfolio (w) by the foreign exchange portfolio (ifx).

[8] Calculated as 0.0025 (per month) × 12 months × 0.86 (the time-series standard deviation of the CMG index, averaged across all countries)

Panel A of Table IV reveals that covariance risk has a positive price (λ_{cov} is positive). The estimates are statistically significant at the five percent level. It also reveals that own country variance risk has a positive price (λ_{var} is positive). The estimates are statistically significant at the ten percent level. Using residuals from the first stage as the dependent variable, we run five panel time-series regressions with country-fixed effects. Models 1, 2, 3, 4 and 5 are as previously defined. We control for liberalization, liquidity risk, and foreign exchange risk as before.

Panel B of Table IV presents the results from this panel time-series regression. The coefficient of the CMG index (model 1) is negative and statistically significant at the one percent level. This is consistent with our hypothesis that capital market governance adversely affects the cost of equity. An increase in CMG of one standard deviation is associated with a 2.9 percent decrease in the cost of equity. At first blush, this result might appear surprisingly large. However, many of the countries in our sample are emerging markets, with yearly returns that range from -18 percent to 28 percent. In this context, our estimate of the impact of improved capital market governance on the cost of equity does not seem extreme.

In sum, we derive the cost of equity using two sharply different methods of estimation – the dividend yield method (implicitly controls for risk, but has less estimation risk) and an international asset pricing model (explicitly controls for risk, but has more estimation risk). Yet the results are strikingly similar – a one standard-deviation change in the CMG index is associated with a 2.6 percent and 2.9 percent change in the cost of capital, respectively. These results suggest our finding is robust to perturbations in the method for estimating the cost of capital.

5.2.3 Liquidity (Trading Volume, Market depth, and US foreign holdings)

Our first measure of market liquidity is trading volume (or turnover), defined as the ratio of the dollar volume of trade to the total market capitalization.[9] We run five panel time-

[9] We also use natural log of the ratio as the dependent variable and the results remain the same.

series regressions with country-fixed effects in table V. The second measure of liquidity is market depth (Turnover/Volatility), and these regressions are reported in table VI.

Table V presents the results from this panel time-series regression. The coefficient of the CMG index is positive and statistically significant at the one percent level. An increase in CMG of one standard deviation is associated with a 9.5 percent increase in trading volume (i.e. the turnover ratio).[10] The results from models 2 to 5 are generally consistent with our conclusion. The coefficients on liberalization are significant, and have the right sign.

<Insert Table V about here>

One concern with the trading volume result is that improved CMG could lead to greater volatility. In terms of overall market liquidity, we are interested in measuring how much volume can be traded without excessive price movements. The Market Depth regressions are aimed at this issue. Specifically, these variables evaluate the extent to which CMG allows a greater volume to be traded per unit of market volatility.

Table VI reports results for the Market Depth regressions. The dependent variable in Model 7 is Volatility. In Models 1, 2, 3, 4 and 5 we compute market depth (Turnover/Volatility), with volatility defined as the standard deviation of daily returns computed each month. In Model 6 we compute Market Depth using the ratio of market turnover to the absolute value of monthly returns. We control for liberalization in all models. The panel regressions use data for the 32 countries for which we have daily return data. We correct for country-specific heteroskedasticity and country-specific autocorrelation.

Table VI shows that the coefficient of the CMG index is positive and statistically significant at the one percent level, indicating that improvements in CMG increase market depth. An increase in CMG of one standard deviation is associated with a 9.3

[10] This is computed as $0.004 \times 0.86 / 0.036$ where 0.86 is average time-series standard deviation of CMG index, and 0.036 is the overall average of market turnover.

percent increase in market depth.[11] The results from models 2 to 7 are also in line with our hypothesis.[12] Model 7 indicates that improved CMG is associated with increased volatility. However, the results from models 1 through 6 show that overall, improved CMG increases market depth – i.e., is associated with increased volume per unit of volatility. In short, our evidence shows that the increase in trading volume due to better governance more than compensates for the increase in volatility, leading to a net improvement in market depth.

<Insert Table VI about here>

In addition to volume and depth, we also use the US holdings as an indirect measure of liquidity. We use as our dependent variable log ratio of the percentage of US stockholdings in each country to the percentage of the market capitalization of the country in the global portfolio as the dependent variable. Five cross-sectional regressions are conducted.[13]

Table VII presents the results from these regressions. In model 1, the coefficient of the capital market governance variable is positive and statistically significant at the one percent level. This is consistent with our hypothesis that our capital market governance measure increases the percentage of holdings by US citizens relative to the size of the market. An increase in CMG of one standard deviation is associated with a 12.7 percent increase in the holdings ratio[14]. These findings are supported in models 2 and 5. Our finding is related to Giannetti and Koskinen (2004) which propose in a theoretical model that investors are biased towards investing in countries with good governance. Dahlquist, Pinkowitz, Stulz and Williamson (2002) find that most firms in countries with poor investor protection are closely held. They argue that this finding might explain part of the home bias of U.S. investors.

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[11] This is calculated as $0.08 \times 0.86 / 0.74$ where 0.86 is average time-series standard deviation of CMG index, and 0.74 is the overall average of market depth.

[12] We also use the conditional volatility of monthly returns computed from the multivariate ARCH model used in the International Asset Pricing Model described above. The results remain the same.

[13] We also used the ratio itself without taking log. The result remains the same.

[14] Computed as $\exp(0.1386 \times 0.86) - 1$ where 0.86 is average time-series standard deviation of CMG index.

<Insert Table VII here>

5.2.6 Pricing Efficiency (Stock price synchronicity and IPO Underpricing)

We have two measures of pricing efficiency, stock price synchronicity and IPO underpricing. Using stock price synchronicity and IPO underpicing as the dependent variable, we run five cross-sectional regressions in tables VIII and IX. All models control for accounting standard, anti-director rights, efficiency of the judicial system, and legal origin.

Table VIII presents the results on stock price synchronicity. In model 1, the coefficient of the capital market governance variable is negative and statistically significant at the one percent level. An increase in CMG of one standard deviation is associated with a 1.9 percent decrease in the stock price synchronicity (the R^2 measure described above). The results from models 2 to 5 are all in the same directions. These findings are consistent with, and generalizes, Bris et al. (2004)'s finding that a relaxation of short sales constraints is associated with improved market pricing efficiency.

<Insert Table VIII here>

Table IX presents the results from the IPO regressions. In model 1, the coefficient of the capital market governance variable is negative and statistically significant at the one percent level. An increase in CMG of one standard deviation is associated with a 5.2 percent decrease in the IPO underpricing[15]. This is consistent with our hypothesis that our capital market governance measure improves pricing efficiency, and reduces the cost to firm insiders of obtaining capital via going public. The results from models 2 to 5 are qualitatively similar.

[15] Calculated as exp(-0.0586 × 0.86) - 1 where 0.86 is average time-series standard deviation of CMG index.

<Insert Table IX here>

6. Additional Robustness Checks

Although we have already conducted a number of robustness checks, the interpretation of our empirical results can still be complicated by potential correlated omitted variables and the endogeneity of capital market governance. We have attempted to deal with these concerns through the use of country-level fixed-effect models. In addition, we now run two additional robustness tests.

First, we reconstruct the CMG index by incorporating an extra factor. We use an aggregate country corruption index to proxy for other governance factors in that country's legal environment. This corruption index published by International Country Risk Guide (ICRG) is more general in scope, and is intended to capture governance effects that are not included in our previous measures (see Lee and Ng (2004)). We reran all the regressions in the paper and find that all the results are robust to the inclusion of this measure.

Second, we estimated a Vector Auto Regression (VAR) model proposed by Sims (1980). In this model, we treat capital market governance, the cost of equity, and market depth as endogenously determined dependent variables. These three endogenous variables are modeled as linear functions of lagged endogenous variables and all exogenous variables in the system. The system of equations in the VAR is estimated jointly. This means that the effect of the independent variables on each endogenous variable takes into account the endogenous nature of the other endogenous variables.

Formally, the system of equations to estimate the effect on the cost of equity is:

$$cost\_of\_equity_{it} = \alpha_{10} + \beta_{i11} CMG_{i,t-1} + \beta_{i12} Forex_{i,t} + \beta_{i13} Liquidity_{i,t-1} + \beta_{i14} Liberalization_{i,t} + u_{1i,t}$$

and

$$CMG_{i,t} = \alpha_{20} + \beta_{i21} cost\_of\_equity_{it-1} + \beta_{i22} Forex_{i,t} + \beta_{i23} Liquidity_{i,t-1} + \beta_{i24} Liberalization_{i,t} + u_{2i,t}$$

The system of equations on market depth (Liquidity) is:

$$Liquidity_{it} = \alpha_{10} + \beta_{i11} CMG_{i,t-1} + \beta_{i12} Liberalization_{i,t} + u_{1i,t}$$

and

$$CMG_{it} = \alpha_{20} + \beta_{i21} Liquidity_{i,t-1} + \beta_{i22} Liberalization_{i,t} + u_{2i,t}$$

The system of equations is estimated jointly using Seemingly Unrelated Regressions (SUR). SUR computes estimates using the technique of joint GLS (Generalized Least Squares). The two error terms $u_{1i,t}$ and $u_{2i,t}$ are allowed to be correlated (see Enders (1996) for further details). The estimation allows for country fixed-effects, for country-specific heteroskedasticity, and for country-specific autocorrelation.

We find that endogeneity does exist. Overall capital market governance is negatively affected by the cost of equity using the dividend yield method. Also, governance is affected by liquidity. However, despite the endogeneity that we explicitly account for, our previous inferences on the effect of capital market governance variables on the cost of equity or trading volume are not affected.[16]

7. Conclusion

This paper explores the link between capital market governance (CMG) and market performance in a broad cross-section of countries. We use variables related to three dimensions of capital market governance – earning opacity, enforcement of insider trading laws, and short-selling. We combine these three dimensions to obtain an overall capital market governance time-series measure per country. We then examine the association between changes in CMG and changes in: (1) the cost of capital (both realized and implied); (2) market liquidity (i.e., trading volume and market depth) , and U.S. foreign stockownership); and (3) pricing efficiency (i.e., stock price synchronicity and IPO underpricing).

We document in our tests that, after controlling for other influences, an increase in overall capital market governance in a country is linked to a decrease in the cost of

equity, an increase in market liquidity, and an increase in pricing efficiency. Specifically, improved security laws are associated with decreased cost of capital, higher trading volume, greater market depth, increased U.S. ownership, lower price synchronicity, and reduced IPO underpricing. These results hold for the overall CMG index, and are directionally consistent for each of the three individual CMG components.

We believe our analyses have important implications for investors, securities regulators and financial academics. Collectively, our evidence points to the importance of security laws to the proper functioning of stock markets. Specifically, our results indicate that increased enforcement of insider trading laws, improved accounting standards (through more stringent auditing and disclosure standards) and a relaxation of short selling constraints are all associated with market performance. Specifically, improvements in these CMG variables lead to decreases in the cost of capital, increases in market liquidity, and increases in market pricing efficiency. In general, the magnitude of these relations suggests they are economically and statistically important.

These findings are consistent with the view that investors associate bad capital market governance with increased risk. Specifically, our findings suggest heightened investor concerns over capital market governance can prompt investors to reduce their trading activity and demand greater premiums for holding equity securities. Interestingly, we also find that bad security laws result in lower market pricing efficiency. To the extent that regulators prefer lower costs of capital, greater market liquidity, and improved pricing efficiency, the prescriptive implications of our results are unambiguous.

[16] We use the implied cost of capital for this test. Because of the two-stage nature of the estimation of the cost of capital using the international asset pricing model method, it was not possible for us to run a VAR for this method.

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Appendix A: Description of Earnings Opacity Measures

Earnings opacity is inherently difficult to measure, particularly across countries, because it is not possible to pinpoint management's motives, and it is difficult to compare accounting standards and the enforcement of these accounting standards. In addition, it is not possible to capture all factors that might influence earnings opacity, or to model how they interact to produce more or less opaque earnings. Therefore, rather than studying the inputs that determine earnings opacity, Bhattacharya, Daouk, and Welker (BDW; 2003) analyze the outcome: the distributional properties of reported accounting numbers across countries and across time that suggest earnings opacity. We adapt the BDW approach in this study, and explain our estimation process in detail below.

We use measures that are intended to capture three attributes of earnings numbers that could lead to earnings opacity: earnings aggressiveness, loss avoidance, and earnings smoothing. We focus on these three dimensions because prior literature has suggested that these three dimensions may weaken the link between accounting performance and the true economic performance of a firm. We limit our analysis of earnings opacity to industrial firms, so that differences in the underlying earnings process across different industry groups, and differences in the proportion of firms in various industry groups across countries and across time, do not affect the dimensions of reported earnings we examine.

Finally, given the above mentioned difficulties in measuring earnings opacity, all our tests are inherently joint tests of two hypotheses: one, our three measures, or a composite of all three, are associated with uninformative or opaque earnings and, two, earnings opacity creates an informational risk that affects the cost of equity and liquidity. We construct a panel data set for each of these three measures of the three dimensions of earnings opacity – earnings aggressiveness, loss avoidance, and earnings smoothing – and then combine them to obtain an overall earnings opacity time-series measure per country.

A.1 Earnings aggressiveness measure

Our first measure of earnings opacity is earnings aggressiveness. Ball, Kothari and Robin (2000) argue that the opposite of aggressiveness, accounting conservatism, which is the more timely incorporation of economic losses versus economic gains into accounting earnings, arises to reduce information asymmetry. Specifically, they argue that three factors are expected to lead to accounting conservatism. First, accountants are aware that managers would like to report economic gains and suppress information about economic losses. Hence, accountants find negative information more credible, and are more likely to incorporate it into accounting income. Second, lenders are important users of financial statements, and lenders are more impacted by economic losses than by economic gains. Third, the timely incorporation of economic losses provides an important corporate governance role, providing quick feedback about bad investment decisions and strategies that managers may not wish to disclose. The first and third of these factors suggest that accounting conservatism is related to informativeness, since conservative accounting is expected to provide information that management may have incentives to withhold otherwise[17].

We follow Givoly and Hayn (2000) and Ahmed et al. (2002) and use accruals to measure earnings aggressiveness. As earnings aggressiveness is the tendency to delay the recognition of losses and speed the recognition of gains, it implies that, if cash flow realizations are held equal, we would expect accruals to increase as earnings aggressiveness increases. Aggressive accounting would be characterized by fewer such negative accruals which capture economic losses, and more positive accruals which capture economic gains, increasing the overall level of accruals. Although unrealized gains and unrealized losses will eventually be recognized in accounting earnings in any clean surplus accounting system, a more conservative accounting system is expected to

[17] It is possible that earnings aggressiveness does not necessarily lead to earnings opacity. It could be argued that conservative accounting prevents good news from being transmitted quickly, thus adding noise. However, given that one might reasonably expect managerial incentives to overstate rather than understate earnings on average, our belief is that aggressive earnings are more opaque earnings, because such accounting reports are more likely to reflect biased and optimistic reporting on the part of management, adding noise to reported earnings and, hence, increasing earnings opacity. To understand these managerial motives, see, for example, Rangan (1998), Teoh et al. (1998), Shivakumar (2000), Healy (1985), Barth et

result in more negative accruals at any given point in time. This result arises because a greater proportion of economic losses relative to economic gains will be reflected in accounting earnings at any point in time.

This observation provides the impetus for us to measure the earnings aggressiveness of a country at a point in time as the median for country i, year t, of accruals divided by lagged total assets. We use the median observation of scaled accruals to minimize the influence of extreme observations. The higher is the median observation of scaled accruals of country i in year t, the higher is the earnings aggressiveness.

Consistent with much of the past literature (e.g., Healy (1985), Jones (1991), Dechow et al. (1995), Leuz et al. (2002)), we compute scaled accruals from balance sheet and income statement information, and then compute scaled cash flows as scaled operating income minus scaled accruals. We do not use information from the cash flow statement because of differences in the presentation of cash flow information across countries and time. In fact, many of our sample countries do not require the preparation or presentation of a statement of cash flows. We define scaled accruals as

$$ACC_{kt} = (CA_{kt} - CL_{kt} - CASH_{kt} + STD_{kt} - DEP_{kt} + TP_{kt}) / TA_{kt-1} \qquad (A1)$$

where

ACC_{kt} = Scaled accruals for firm k, year t
CA_{kt} = Change in total current assets for firm k, year t
CL_{kt} = Change in total current liabilities for firm k, year t
$CASH_{kt}$ = Change in cash for firm k, year t
STD_{kt} = Change in current portion of long-term debt included in total current liabilities for firm k, year t

al. (1999). Ultimately, whether earnings aggressiveness leads to earnings opacity or not is an empirical issue.

DEP_{kt} = Depreciation and amortization expense for firm k, year t

TP_{kt} = Change in income taxes payable for firm k, year t

TA_{kt-1} = Total assets for firm k, year t-1.

A.2 Loss avoidance measure

Our second measure of earnings opacity is loss avoidance behavior. Burgstahler and Dichev (1997) present persuasive evidence that U.S. firms engage in earnings management to avoid reporting negative earnings. DeGeorge et al. (1999) provide evidence that suggests that the following hierarchy exists among three earnings thresholds: 1) avoiding negative earnings, 2) reporting increases in quarterly earnings, and 3) meeting analysts' earnings forecasts. As Burgstahler and Dichev (1997) and DeGeorge et al. (1999) discuss, these results indicate that incentives to report positive earnings (i.e., beat a benchmark of zero earnings) exist for some sample firms. Such loss avoidance behavior obscures the relationship between earnings and economic performance, thus increasing earnings opacity.

We define firms with small positive earnings (small negative earnings) as firms with net income scaled by lagged total assets between 0 and 1% (between 0 and -1%). We find the ratio of the number of firms with small positive earnings minus the number of firms with small negative earnings divided by their sum. The higher is this ratio in country i, year t, the higher is the loss avoidance.

A.3 Earnings smoothing measure

Our third measure of earnings opacity is earnings smoothing. Some accounting standards (for example, cases of high book/tax conformity) or some managerial motives may lead to smooth earnings over time. If accounting earnings are artificially smooth, they fail to depict the true swings in underlying firm performance, thus decreasing the informativeness of reported earnings and, hence, increasing earnings opacity. This is consistent with the view of earnings smoothing taken in Leuz et al. (2002). An alternative view, is that earnings smoothing can be used by management as a means to convey information, potentially decreasing earnings opacity. While we believe that

earnings smoothing at the country level is indicative of accounting that obscures information about economic volatility, whether or not earnings smoothing leads to earnings opacity and adverse capital market consequences is again an empirical issue.

Following Leuz et al. (2002), we find the cross-sectional correlation between the change in accruals and the change in cash flows, both scaled by lagged total assets, in country i, year t. Cash flows are obtained by subtracting accruals (which were obtained in (A1)) from operating earnings. Because some degree of earnings smoothing is a natural outcome of any accrual accounting process, this measure is expected to be negative on average. However, the more negative this correlation, the more likely it is that earnings smoothing is obscuring the variability in underlying economic performance, and the greater is the earnings opacity.

A.4 Combining the Measures

We construct a panel data set for each of these three measures of the three dimensions of earnings opacity, and combine them to create an aggregate Earnings Opacity score. Specifically, we rank each country-month into deciles for each measure, and take the average of these three rankings for each country-month to create the index. The descriptive statistic reported in Table 1 is the average score across all available months for each country.

Appendix B: International Asset Pricing Model

In computing the cost of capital using average realized returns, we adopt a simplified version of the international asset pricing model in Bekaert and Harvey (1995). This appendix describes the model and our estimation procedure.

The basic model we use is expressed as follows:

$$(r_{i,t}) - (r_{f,t}) = \alpha_0 + \phi_{i,t}\lambda_{\text{cov}} h_{i,w,t} + (1-\phi_{i,t})\lambda_{\text{var}} h_{i,t} + e_{i,t} \qquad \text{(B1)}$$

where

$r_{i,t}$ is the dollar monthly return of the stock market index of country i at time t,
$r_{f,t}$ is the monthly return of the one month U.S. T-Bill at time t,
α_0 is a constant that would be estimated,
$\phi_{i,t}$ is a measure of the level of integration of country i at time t, $0 < \phi_{i,t} < 1$,
λ_{cov} is the price of the covariance risk that would be estimated,
$h_{i,w,t}$ is the conditional covariance of the monthly return of the stock market index of country i with the monthly return of the world index at time t,
λ_{var} is the price of own country variance risk that would be estimated (which we are restricting to be the same across all countries),
$h_{i,t}$ is the conditional variance of the monthly return of the stock market index of country i at time t, and
$e_{i,t}$ is the residual error term.

The independent variables in model (B1) – conditional covariance $h_{i,w,t}$ and conditional variance $h_{i,t}$ – are separately estimated pair-wise for each country i and world pair from the multivariate ARCH model specified below:

$$
\begin{aligned}
r_{i,t} &= c_1 + \varepsilon_{i,t}, \\
r_{w,t} &= c_2 + \varepsilon_{w,t}, \\
h_{i,t} &= b_1 + a_1\left(\frac{1}{2}\varepsilon_{i,t-1}^2 + \frac{1}{3}\varepsilon_{i,t-2}^2 + \frac{1}{6}\varepsilon_{i,t-3}^2\right), \\
h_{w,t} &= b_2 + a_2\left(\frac{1}{2}\varepsilon_{w,t-1}^2 + \frac{1}{3}\varepsilon_{w,t-2}^2 + \frac{1}{6}\varepsilon_{w,t-3}^2\right), \\
h_{i,w,t} &= b_3 + a_3\left(\frac{1}{2}\varepsilon_{i,t-1}\varepsilon_{w,t-1} + \frac{1}{3}\varepsilon_{i,t-2}\varepsilon_{w,t-2} + \frac{1}{6}\varepsilon_{i,t-3}\varepsilon_{w,t-3}\right), \\
\varepsilon_{i,t}, \varepsilon_{w,t} &\sim N\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix} h_{i,t} & h_{i,w,t} \\ h_{i,w,t} & h_{w,t}\end{bmatrix}\right).
\end{aligned}
\tag{B2}
$$

where

$r_{w,t}$ is the dollar monthly return of the stock market index of the world at time t,

$\varepsilon_{i,t-j}$ is the innovation in monthly return of the stock market index of country i at time t-j, j. {0,1,2,3},

$\varepsilon_{w,t-j}$ is the innovation in monthly return of the stock market index of the world at time t-j, j. {0,1,2,3},and

$h_{w,t}$ is the conditional variance of the monthly return of the stock market index of the world at time t.

Model (B2) was first introduced by Bollerslev, Engle, and Wooldridge (1988). As in Engle, Lilien, and Robins (1987), the weights of the lagged residual vectors are taken to be 1/2, 1/3, and 1/6, respectively. The constants a_2 , b_2 , and c_2 are constrained to be identical for all country-world pairs. Maximum likelihood is used to estimate model (B2).

The other independent variable in model (1) – $\phi_{i,t}$ – measures the level of integration of country i at time t. We define it as follows:

$$\phi_{i,t} = \frac{\exp\left(a_1 \left(\frac{\text{exp}orts_{i,t} + imports_{i,t}}{gdp_{i,t}} \right) \right)}{1 + \exp\left(a_1 \left(\frac{\text{exp}orts_{i,t} + imports_{i,t}}{gdp_{i,t}} \right) \right)} \qquad \text{(B3)}$$

The definition of $\phi_{i,t}$ in (B3) implies that it is a function of the ratio of the sum of exports and imports to gross domestic product. It is designed to take on values between zero and one. When its value is zero, the country is not integrated with world equity markets, and its equity is exposed only to local risk (own variance). When its value is one, the country is fully integrated with world equity markets, and its equity is exposed only to global risk (covariance with world factor). Bekaert and Harvey (1997) find that increases in this ratio are empirically associated with increased importance of the world factor relative to local risk factors.

We use a two-step procedure (first remove the effect of risk, and then test the effect on residuals) instead of using a one-step procedure (include all independent variables in model (B1) directly). We do so because of technical convergence problems in the one-step non-linear estimation procedure. If the capital market governance variables have no incremental effect on the cost of equity, then those variables will be orthogonal to the residuals from the model in (B1). We control for other influences on this residual. The advantage of using a well-specified asset pricing factor model like (B1) to measure cost of equity is that we explicitly account for risk. This comes at a price. Recall that all the independent variables in model (B1) are estimates from other models. This introduces estimation error, which reduces power and may introduce bias.

Table I
Summary Statistics, 1969-1998

Countries	Earnings Opacity	Short Selling	Put Options	Insider Trading Enforcement	Capital Market Governance	Cost of equity	Expected return	Vol/Cap (turnover)	Market depth	Volatility	Syncronicity	log (%US holdings/% Mkt cap)	IPO return
Australia	6.31	1969	1982	1996	5.62	0.112	0.114	0.04	0.74	0.05	0.06	-1.47	0.12
Austria	5.31	1969	1991	No	4.77	0.154	0.087	0.04	0.88	0.05	0.09	-0.84	0.06
Belgium	6.59	1969	1992	1994	6.22	0.113	0.093	0.01	0.32	0.04	0.15	-1.98	0.15
Brazil	6.63	No	1984	1978	8.54	No	0.177	No	No	0.08	0.16	-1.19	0.79
Canada	6.51	1969	1975	1976	8.50	0.054	0.108	0.03	0.95	0.03	0.06	-1.15	0.06
Chile	4.00	No	1994	1996	5.00	0.047	0.077	0.01	0.21	0.05	0.21	-2.10	0.09
Denmark	5.64	1969	1990	1996	5.48	0.139	0.094	0.02	0.45	0.04	0.07	-1.49	0.05
Finland	5.72	No	1988	1993	6.09	0.094	0.113	No	No	No	0.14	-0.72	0.10
France	6.36	1969	1987	1975	8.45	0.142	0.113	0.03	0.75	0.05	0.07	-1.13	0.12
Germany	5.54	1969	1990	1995	5.62	0.101	0.102	0.14	3.57	0.05	0.11	-1.77	0.28
Greece	3.11	No	No	1996	1.44	0.211	0.085	0.02	0.34	0.08	0.19	-2.46	0.49
Hong Kong	5.00	1994	1993	1994	3.83	0.164	0.126	0.04	0.62	0.07	0.15	-2.24	0.17
India	3.95	No	No	No	0.98	0.115	0.076	0.03	0.58	0.06	0.19	-2.37	0.35
Ireland	5.16	1986	No	No	4.72	0.115	0.109	No	No	0.05	0.06	-0.29	No
Italy	4.41	1969	1995	1996	4.98	0.108	0.105	0.03	0.45	0.06	0.18	-1.22	0.22
Japan	4.05	1969	1989	1990	6.40	0.057	0.120	0.03	0.54	0.06	0.23	-2.52	0.28
Malaysia	4.46	1996	No	1996	1.92	-0.005	0.115	0.02	0.29	0.07	0.43	-1.77	1.04
Mexico	6.52	1969	No	No	5.17	0.005	0.106	0.04	0.64	0.08	0.29	-0.65	0.33
Netherlands	5.49	1969	1978	1994	5.85	0.135	0.107	0.06	1.63	0.04	No	-0.87	0.10
Norway	7.00	No	1990	1990	6.85	0.120	0.111	0.04	0.86	0.06	0.12	-0.96	0.13
Pakistan	4.38	No	No	No	1.13	No	0.056	No	No	0.08	0.17	No	No
Portugal	7.00	1986	No	No	5.33	0.072	0.096	0.03	0.66	0.04	0.07	-1.33	0.11
Singapore	4.89	1969	1993	1978	7.96	0.064	0.115	0.02	0.41	0.05	0.19	-1.98	0.30
South Africa	4.74	1969	1992	No	4.58	0.091	0.111	0.02	0.37	0.06	0.20	-2.20	0.33
South Korea	3.47	No	1997	1988	4.49	-0.092	0.089	0.06	0.72	0.12	0.17	-1.71	0.74
Spain	5.94	No	1992	No	3.46	0.095	0.103	0.04	0.88	0.05	0.19	-1.74	0.11
Sweden	5.59	1993	1987	1990	6.40	0.151	0.105	0.03	0.61	0.06	0.14	-0.94	0.31
Switzerland	5.59	1969	1988	1995	5.63	0.150	0.106	0.04	1.07	0.05	No	-1.25	0.35
Taiwan	4.89	1980	No	1989	7.96	0.031	0.093	0.14	1.92	0.08	0.41	-3.36	0.31
Thailand	5.29	No	No	1993	3.81	-0.101	0.082	0.04	0.55	0.09	0.27	-2.43	0.47
Turkey	4.78	1995	No	1996	4.04	0.083	0.080	0.07	0.60	0.14	0.39	-1.45	0.13
United Kingdom	5.92	1969	1984	1981	8.31	0.132	0.116	0.05	1.19	0.04	0.06	-1.97	0.17
United States	7.49	1969	1973	1969	8.83	0.083	0.106	0.06	1.95	0.04	0.02	0.99	0.18

Column 1 presents the countries in our dataset in alphabetical order. For each country, we report the average CMG index value, the average of each of the three components of the index. The "Earnings Opacity" score is the average of three earnings opacity decile rankings. To construct this number, we rank each country-month into deciles on each of three opacity measures (earning aggressiveness, loss aversion, and income smoothing). We then take the average of these three rankings in computing an opacity index. Table values represent the monthly average index value for each country. Higher scores indicate lower opacity (i.e. greater transparency). The values associated with "Short Selling" and "Put Options" represent the date each was first allowed in a given country. The "Insider Trading Enforcement" column reports the date of the first enforcement action against an insider for trading violations. The liquidity variable is the natural logarithm of the ratio of volume to market capitalization. The equity return for each country is computed from its stock market index. The variable market depth is the ratio of market turnover to return volatility. We measure volatility as either the standard deviation of daily returns computed each month (*Volatility*), or the absolute monthly return for that month (|*Return*|). The variable log(%US stockholdings/%Market Cap) is the ratio of percentage of US stockholdings in country i to the percentage of market capitalization in country i. To mitigate the effect of outliers, we take the natural logarithm of this ratio. The variable Synchronicity, is measured as the average R^2 of firm-level regressions of bi-weekly stock returns on local and U.S. market indexes in each country. The variable, IPO returns, is the initial returns accruing to investors in IPOs of common stock. This variable was downloaded from Jay Ritter's web site (http://bear.cba.ufl.edu/ritter/).

Table II
Ranking of Countries

Earnings Opacity	Insider Trading Enforcement	Short Selling/Put Option	CMG Index
United States	United States	United States	United States
Portugal	Brazil	Australia	Brazil
Norway	France	Austria	Canada
Brazil	Canada	South Africa	France
Belgium	Singapore	Ireland	United Kingdom
Mexico	Taiwan	Canada	Taiwan
Canada	United Kingdom	Singapore	Singapore
France	Finland	Taiwan	Norway
Australia	South Korea	Germany	Japan
Spain	Japan	Mexico	Sweden
United Kingdom	Norway	Japan	Belgium
Finland	Sweden	Italy	Finland
Denmark	Thailand	Netherlands	Netherlands
Sweden	Turkey	France	Switzerland
Switzerland	Malaysia	Switzerland	Germany
Germany	Hong Kong	United Kingdom	Australia
Netherlands	Belgium	Denmark	Denmark
Austria	Netherlands	Belgium	Portugal
Thailand	Switzerland	Portugal	Mexico
Ireland	Germany	Finland	Chile
Hong Kong	Chile	Brazil	Italy
Taiwan	Greece	Sweden	Austria
Singapore	Australia	Norway	Ireland
Turkey	Italy	Spain	South Africa
South Africa	Denmark	Hong Kong	South Korea
Malaysia	India	Chile	Turkey
Italy	South Africa	Turkey	Hong Kong
Pakistan	Portugal	South Korea	Thailand
Japan	Spain	Malaysia	Spain
Chile	Ireland	Greece	Malaysia
India	Pakistan	Pakistan	Greece
South Korea	Austria	India	Pakistan
Greece	Mexico	Thailand	India

Countries are ranked by decreasing quality of different components of the CMG index (columns 1 to 3). In ranking countries by Short selling/Put Option, we take the earlier of the two introduction dates. Also reported in this table is the rank of each country according to the CMG index itself (column 4).

Table III

Effect of Capital Market Governance on the Cost of Equity

(Using Dividend Yield as a proxy)

Dependent Variable	Cost of Equity				
Independent Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	-0.0025				
	(-4.23)				
Insider Trading		-0.0011			-0.0005
		(-2.71)			(-1.58)
Earning Opacity			-0.0029		-0.0025
			(-3.46)		(-2.98)
Short Selling				-0.0007	-0.0005
				(-1.99)	(-1.10)
Forex	2.4948	-0.1375	0.1006	2.4517	2.4392
	(0.98)	(-0.04)	(0.03)	(0.91)	(0.94)
Liquidity	-0.0009	0.0005	-0.0022	-0.0002	-0.0009
	(-0.82)	(0.25)	(-1.92)	(-0.12)	(-0.89)
Liberalization	-0.0038	-0.0035	-0.0029	-0.0038	-0.0024
	(-0.65)	(-0.82)	(-0.61)	(-0.77)	(-0.45)
Country Fixed Effects not included					
No of observations	3414	4479	3498	4375	3414

The panel regressions with country-fixed effects are based on monthly data. They are corrected for country-specific heteroskedasticity and country-specific autocorrelation. t-statistics are reported in the parentheses. The dependent variable is k, the cost of equity. It is defined as follows. It is computed as the sum of the dividend yield forecast and the growth rate of the dividend. The "CMG" variable is capital market governance and it consists of three different elements: (1) the level of earning opacity, (2) enforcement of insider trading laws, and (3) short-selling restrictions. The indicator variable "liberalization" changes from zero to one in the month after the official liberalization date that was obtained from Bekaert and Harvey (2000). The liquidity variable is the natural logarithm of the ratio of volume to market capitalization. "Forex" is the conditional covariance of the return of the stock market index with the depreciation of the ith foreign currency with respect to the dollar at time t. It is estimated using a multivariate ARCH model. The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation.

Table IV
Effect of Capital Market Governance on the Cost of Equity
(Using an International Asset Pricing Model)

Model 1:
The international asset pricing factor model used for risk-adjusting is

$$\left(r_{i,t} - r_{f,t}\right) = \alpha_0 + \phi_{i,t}\lambda_{\text{cov}} h_{i,w,t} + \left(1 + \phi_{i,t}\right)\lambda_{\text{var}} h_{i,t} + e_{i,t}$$

where the measure of integration of country i at time t, $\phi_{i,t}$, is defined in the text. λ_{cov} is the price of the covariance risk with the world, and λ_{var} is the price of own country variance risk. The independent variables are the conditional covariances and variances, $h_{i,w,t}$ and $h_{i,t}$, respectively, and these are obtained from the multivariate ARCH model as defined in the text.

Panel A: Some coefficients of the risk-adjustment model, MODEL 1

Parameter	Coefficient	p-value
α_0	0.0011	0.5534
α_1	15.6094	0.0283
λ_{cov}	2.2157	0.0471
λ_{var}	2.3984	0.0615

In Panel B, the dependent variable is the monthly equity return for each country minus the one mounth U.S. T-Bill return. The equity return for each country is computed from its stock market index. Data on monthly stock market indices for the 20 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 14 emerging markets were obtained from the International Financial Corporation (IFC). The data for the one-month U.S. Treasury bill return was obtained from Datastream. The measure of a country's integration with the world, as defined above, is computed from its exports, imports, and GDP. It is equation (3) in the text. Data on quarterly/annual GDP, monthly exports and monthly imports were from the International Financial Statistics of the International Monetary Fund. The statistics for Taiwan come from Datastream.

The conditional covariance of the return of the stock market index with the depreciation of the i^{th} foreign currency with respect to the dollar at time t, defined as the foreign exchange risk and denoted as $h_{i,ifx,t}$, is estimated from the multivariate ARCH model as defined in the text. t-statistics are reported in the parentheses.

Panel B: Effect on Residuals (risk Adjusted)

Dependent Variable	Residual from Risk Adjustment Model				
Independent Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	-0.0028				
	(-3.07)				
Insider Trading		-0.0017			-0.0009
		(-4.30)			(-1.76)
Earning Opacity			-0.0004		0.0002
			(-0.46)		(0.23)
Short Selling				-0.0015	-0.0013
				(-2.57)	(-1.82)
Forex	7.2954	5.9985	7.1289	6.0448	7.2660
	(5.34)	(4.26)	(5.15)	(4.33)	(5.32)
Liquidity	0.0054	0.0080	0.0032	0.0075	0.0053
	(3.05)	(5.30)	(1.84)	(5.12)	(2.94)
Liberalization	-0.0076	-0.0200	-0.0076	-0.0205	-0.0080
	(-0.73)	(-2.72)	(-0.72)	(-2.81)	(-0.76)
country fixed effects not reported					
No of observations	3200	4214	3272	4121	3200

Table V

Effect of Capital Market Governance on Trading Volume

Dependent Variable	Vol/Cap (Turnover)				
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	0.0040				
	(3.75)				
Insider Trading		0.0020			0.0019
		(4.91)			(3.39)
Earning Opacity			0.0012		0.0004
			(1.73)		(0.71)
Short Selling				0.0021	0.0002
				(4.93)	(0.24)
Liberalization	0.0133	0.0097	0.0161	0.0100	0.0147
	(2.38)	(1.66)	(3.22)	(1.71)	(2.44)
country fixed effects not reported					
No of observations	3469	4720	3553	4615	3469

The panel regressions with country fixed-effects are based on monthly data. They are corrected for country-specific heteroskedasticity and country-specific autocorrelation. t-statistics are reported in the parentheses. The dependent variable is Vol/Cap, and it is the ratio of volume to market capitalization. The first independent variable is "CMG". "CMG" is capital market governance and it consists of three different elements: 1- the level of earning opacity, 2- enforcement of insider trading laws, and 3- short-selling restrictions. The next three independent variables are the three components of CMG. The fifth independent variable is the liberalization variable. It is coded as follows. The indicator variable "liberalization" changes from zero to one in the month after the official liberalization date that was obtained from Bekaert and Harvey (2000). The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation.

Table VI

Effect of Capital Market Governance on Market Depth

	Market Depth						
Dependent Variable	Turnover/Volatility					Turnover/|Return|	Volatility
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
CMG	0.0791					0.1438	0.0024
	(2.83)					(2.69)	(1.93)
Insider Trading		0.0304			0.0205		
		(1.35)			(0.94)		
Earning Opacity			0.0419		0.0417		
			(4.17)		(3.16)		
Short Selling				0.0324	-0.0090		
				(3.04)	(-0.59)		
Liberalization	0.1366	0.2004	0.0335	0.0492	0.1368	0.3863	-0.0042
	(4.08)	(8.68)	(0.45)	(0.54)	(3.79)	(3.02)	(-2.84)
country fixed effects not reported							
No of observations	3385	3469	4562	4457	3385	3355	3865

The panel regressions with country fixed-effects are based on monthly data. They are corrected for country-specific heteroskedasticity and country-specific autocorrelation. t-statistics are reported in the parentheses. The dependent variable in the first six models is market depth, defined as the ratio of market turnover to return volatility. Market turnover is volume/market cap as defined in Table V. We measure volatility as either the standard deviation of daily returns computed each month (*Volatility*), or the absolute monthly return for that month (|*Return*|). In Model 7, the dependent variable is *Volatility*.

The first independent variable is "CMG". "CMG" is capital market governance and it consists of three different elements: 1- the level of earning opacity, 2- enforcement of insider trading laws, and 3- short-selling restrictions. The next three independent variables are the three components of CMG. The fifth independent variable is the liberalization variable. It is coded as follows. The indicator variable "liberalization" changes from zero to one in the month after the official liberalization date that was obtained from Bekaert and Harvey (2000). The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation.

Table VII

Effect of Earnings Opacity on US Foreign Stockholdings

Dependent Variable	% US stockholdings/ % Market Cap				
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	0.1386				
	(1.72)				
Insider Trading		0.3132			0.3122
		(2.69)			(2.20)
Earning Opacity			0.0813		0.0750
			(1.65)		(1.35)
Short Selling				0.0284	-0.0183
				(0.94)	(-0.50)
Acctstand	-0.0083	0.0054	-0.0113	-0.0005	-0.0072
	(-0.40)	(0.31)	(-0.63)	(-0.03)	(-0.36)
Antidir	-0.0431	0.0329	0.0516	0.1208	-0.0585
	(-0.26)	(0.24)	(0.44)	(1.03)	(-0.39)
Judsys	-0.0211	-0.0377	0.0202	0.0005	-0.0201
	(-0.25)	(-0.49)	(0.27)	(0.01)	(-0.25)
French Law	-0.3523	-0.0721	-0.0005	0.0954	-0.2734
	(-0.58)	(-0.15)	(-0.0)	(0.21)	(-0.52)
German Law	-0.6291	-0.1353	-0.4166	-0.3489	-0.2737
	(-1.24)	(-0.32)	(-1.01)	(-0.82)	(-0.60)
Scandinavian Law	0.2234	0.2333	0.4094	0.4136	0.2150
	(0.50)	(0.57)	(1.01)	(0.99)	(0.52)
country fixed effects not reported					
No of observations	29	29	32	32	29

Foreign stockholdings by US citizens for 1997 are from Bhattacharya and Groznik (2003). The data are from the survey carried out by the U.S. Treasury Department and the Board of Governors of the Federal Reserve System. The dependent variable is the ratio of percentage of US stockholdings in country i to the percentage of market capitalization in country i. To mitigate the effect of outliers, we take the natural logarithm of this ratio. The first independent variable is "CMG". "CMG" is capital market governance and it consists of three different elements: 1- the level of earning opacity, 2- enforcement of insider trading laws, and 3- short-selling restrictions. The next three independent variables are the three components of CMG. We control for three variables that were featured in La Porta et al. (1998) as measures of the level of corporate governance and protection of minority shareholder rights. Judsys is a measure of the efficacy of the judicial system, ranging from 0 (least efficient) to 10 (most efficient). Antidir is an aggregate index developed by La Porta et al. (1998) to capture shareholder rights within a country. Acctstand is a crude measure of the quality of financial reporting in a country, based on the inclusion or omission of 90 items in seven categories. We also use binary variables that represent the legal origin of the different countries (English, French, German and Scandinavian legal regimes.) The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation. t-statistics are reported in the parentheses.

Table VIII

Effect of Earnings Opacity on Stock Synchronicity

Dependent Variable	Stock Price Synchronicity				
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	-0.0224				
	(-2.05)				
Insider Trading		-0.0354			-0.0252
		(-2.04)			(-1.14)
Earning Opacity			0.0013		-0.0044
			(0.19)		(-0.52)
Short Selling				-0.0065	-0.0034
				(-1.62)	(-0.62)
Acctstand	0.0708	0.0167	-0.0373	-0.0262	0.0322
	(0.86)	(0.23)	(-0.54)	(-0.40)	(0.40)
Antidir	0.1113	0.0324	0.0200	0.0424	0.0581
	(1.59)	(0.51)	(0.32)	(0.70)	(0.80)
Judsys	0.0057	-0.0004	-0.0224	-0.0295	-0.0111
	(0.09)	(-0.01)	(-0.36)	(-0.50)	(-0.17)
French Law	0.0062	0.0039	0.0013	0.0020	0.0047
	(2.20)	(1.51)	(0.54)	(0.88)	(1.55)
German Law	0.0070	-0.0062	-0.0210	-0.0223	-0.0027
	(0.31)	(-0.30)	(-1.08)	(-1.25)	(-0.11)
Scandinavian Law	-0.0290	-0.0293	-0.0299	-0.0240	-0.0271
	(-2.55)	(-2.58)	(-2.68)	(-2.18)	(-2.19)
country fixed effects not reported					
No of observations	28	28	32	32	28

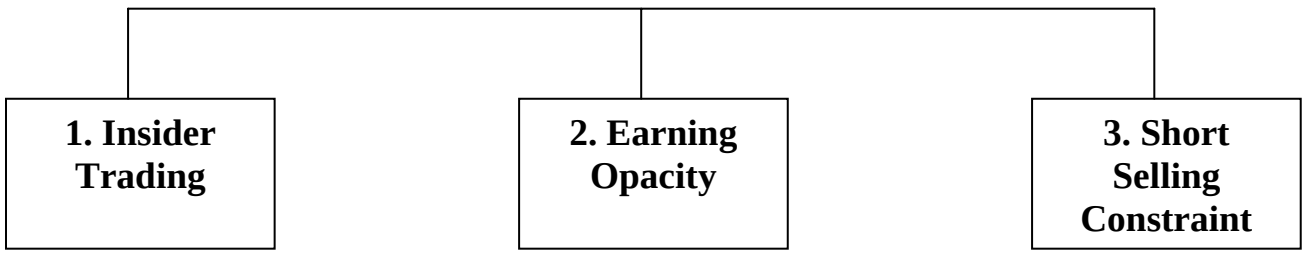
The dependent variable, Stock Price Synchronicity, is measured as the average R^2 of firm-level regressions of bi-weekly stock returns on local and U.S. market indexes in each country. The first independent variable is "CMG". "CMG" is capital market governance and it consists of three different elements: 1- the level of earning opacity, 2- enforcement of insider trading laws, and 3- short-selling restrictions. The next three independent variables are the three components of CMG. We control for three variables that were featured in La Porta et al. (1998) as measures of the level of corporate governance and protection of minority shareholder rights. Judsys is a measure of the efficacy of the judicial system, ranging from 0 (least efficient) to 10 (most efficient). Antidir is an aggregate index developed by La Porta et al. (1998) to capture shareholder rights within a country. Acctstand is a crude measure of the quality of financial reporting in a country, based on the inclusion or omission of 90 items in seven categories. We also use binary variables that represent the legal origin of the different countries (English, French, German and Scandinavian legal regimes.) The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation. t-statistics are reported in the parentheses.

Table IX
Effect of Earnings Opacity on IPO returns

Dependent Variable	IPO returns				
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
CMG	-0.0586				
	(-3.01)				
Insider Trading		-0.0771			-0.0395
		(-2.37)			(-1.03)
Earning Opacity			-0.0101		0.0044
			(-0.84)		(0.30)
Short Selling				-0.0189	-0.0187
				(-2.65)	(-1.91)
Acctstand	-0.0914	-0.2421	-0.2414	-0.1946	-0.2270
	(-0.66)	(-1.84)	(-2.08)	(-1.85)	(-1.72)
Antidir	0.1097	-0.0788	-0.0129	0.0465	-0.0244
	(0.90)	(-0.67)	(-0.12)	(0.46)	(-0.20)
Judsys	-0.1435	-0.1749	-0.2037	-0.1998	-0.2165
	(-1.31)	(-1.53)	(-1.79)	(-1.98)	(-1.92)
French Law	0.0130	0.0071	0.0091	0.0090	0.0068
	(2.60)	(1.46)	(1.86)	(2.13)	(1.28)
German Law	-0.0257	-0.0667	-0.0639	-0.0740	-0.0750
	(-0.66)	(-1.78)	(-1.85)	(-2.42)	(-1.89)
Scandinavian Law	-0.0342	-0.0352	-0.0485	-0.0333	-0.0209
	(-1.78)	(-1.71)	(-2.49)	(-1.80)	(-0.99)
country fixed effects not reported					
No of observations	30	30	33	33	30

The dependent variable, IPO returns, is the initial returns accruing to investors in IPOs of common stock. This variable was downloaded from Jay Ritter's web site (http://bear.cba.ufl.edu/ritter/). The first independent variable is "CMG". "CMG" is capital market governance and it consists of three different elements: 1- the level of earning opacity, 2- enforcement of insider trading laws, and 3- short-selling restrictions. The next three independent variables are the three components of CMG. We control for three variables that were featured in La Porta et al. (1998) as measures of the level of corporate governance and protection of minority shareholder rights. Judsys is a measure of the efficacy of the judicial system, ranging from 0 (least efficient) to 10 (most efficient). Antidir is an aggregate index developed by La Porta et al. (1998) to capture shareholder rights within a country. Acctstand is a crude measure of the quality of financial reporting in a country, based on the inclusion or omission of 90 items in seven categories. We also use binary variables that represent the legal origin of the different countries (English, French, German and Scandinavian legal regimes.) The equity data for developed countries are from Morgan Stanley Capital International, and the equity data for emerging markets are from International Financial Corporation. t-statistics are reported in the parentheses.

Figure 1: Capital Market Governance Measures



1.1 Insider Trading Dummy
Insider trading dummy is zero if insider trading law has never been enforced and ten if it was enforced.

2.1 Earning Aggressiveness
The ratio of Accruals to Total Asset. The higher is this ratio, the higher is earning aggressiveness.

2.2 Loss Avoidance
The number of firms with small positive earnings minus the number of firms with small negative earnings, all divided by their sum. The higher is this ratio, the higher is the loss avoidance.

2.3 Earning Smoothing
Correlation between change in accruals and change in cash flows. The higher is this ratio, the higher is earning smoothing.

3.1 Short Selling Constraint
A dummy which equals ten after short selling became feasible in a country.

3.2 Put Option
A dummy which equals ten after the date when put option became feasible.

Figure 2: Market Performance Measures and Their Empirical Proxies

1.1 Implied Cost-of-capital
The implied cost of equity capital, derived from current market price and a dividend discount model.

1.2 Average Realized Returns
The average realized returns, based on an international asset pricing model (Bekaert and Harvey (1995))

2.1 Trading Volume
The ratio of dollar traded per month to the dollar market capitalization at the end of the month.

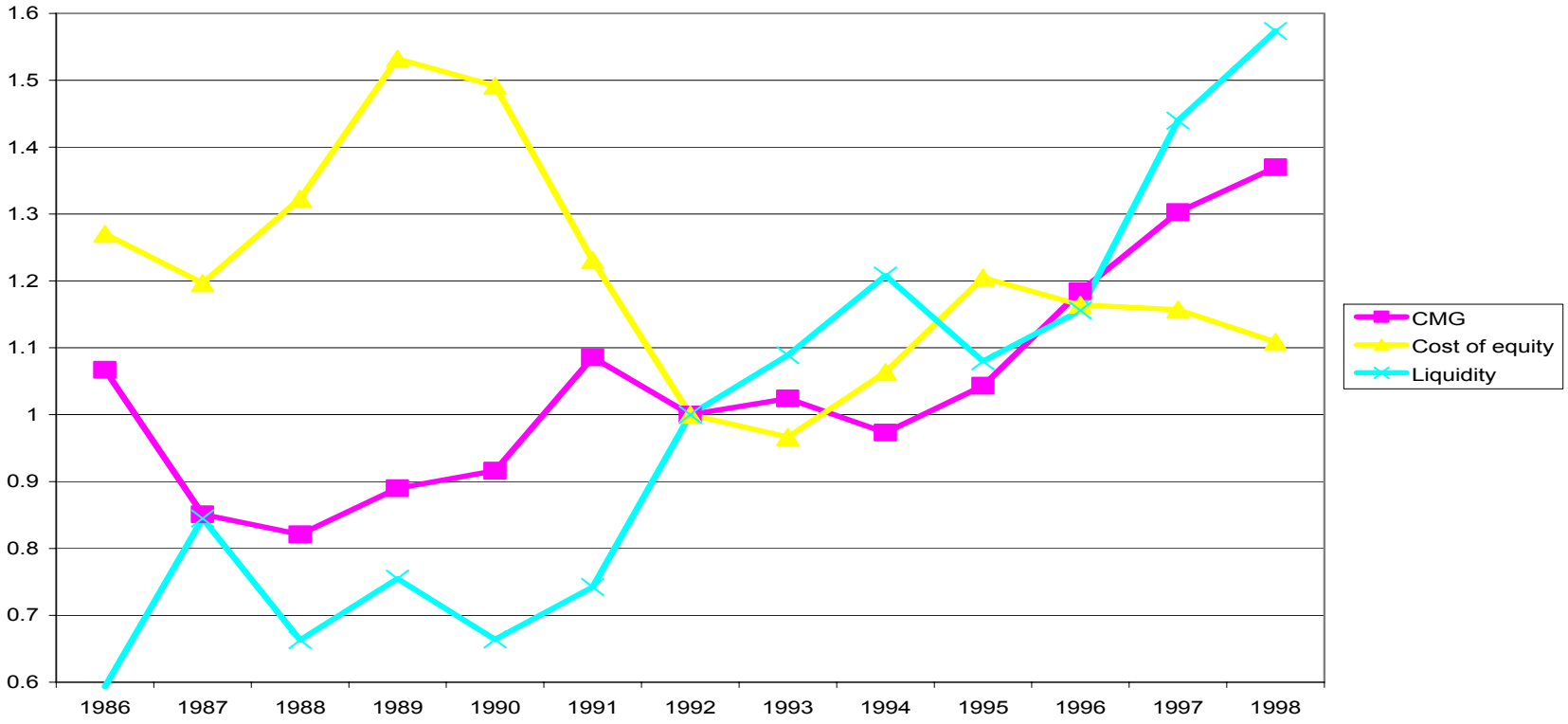
2.2 Market Depth
The ratio of trading volume to the standard deviation of daily returns (or the absolute value of monthly return) computed each month.

2.3 U.S. Foreign Investment
The over (under) weight in stockholdings by U.S. investors, relative to that country's weight in a global index.

3.1 Stock Price Synchronicity
The average R^2 from firm-level regressions of bi-weekly stock returns on local and U. S. market indices in each country (Morck, Yeung and Yu (2000)). This variable measures the ratio of firm-specific to market-level information. Countries with higher average R^2 are deemed to be less efficient.

3.2 IPO Underpricing
Based on the average initial-day returns on IPOs. Countries with larger IPO underpricing are deemed to be less efficient.

Figure 3: Capital Market Governance, Liquidity, and Cost of Equity



This figure depicts the time-series of CMG, liquidity, and cost of equity, averaged over all countries. CMG is our measure of capital market governance, based on three elements: (1) the degree of earning opacity, (2) the enforcement of insider trading laws, and (3) the relaxation of short-selling restrictions. Liquidity is the ratio of trading volume to market capitalization; Cost of Equity is excess return based on an international asset pricing model. For presentation, we normalize all three time series to a value of one in 1992.

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