The Impact of Legal and Political Institutions on Equity Trading Costs: A Cross-Country Analysis

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We conjecture that macro-level institutions affect equity trading costs through their impact on information risk and investor participation. In a study of trading costs for 412 NYSE-listed American Depository Receipts (ADRs) from 44 countries, we find that, after controlling for firm-level determinants of trading costs, effective spreads and price impact of trades are significantly lower for stocks from countries with better ratings for judicial efficiency, accounting standards, and political stability. Trading costs are significantly higher for stocks from French civil law countries than from common law countries. Overall, we conclude that improvements in legal and political institutions will lower the cost of liquidity in financial markets.

Following the seminal work by Demsetz (1968), a number of researchers have studied the determinants of transaction costs in stock markets. Broadly, these studies have focused either on firm-level characteristics or on stock market structure to explain equilibrium trading cost.[1] In contrast, this article examines the impact of a country's macro-level institutions on the cost of liquidity. Institutions—defined broadly as both legal and political—may affect the liquidity in capital markets through their impact on information risk and investor participation. In

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[1] See for example, Benston and Hagerman (1974), Copeland and Galai (1983), Amihud and Mendelson (1987), Stoll (1989), Huang and Stoll (1996), Bessembinder and Kaufman (1997), and Stoll (2000).

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this article, we discuss these linkages and empirically explore the relation between macro institutions and equity trading costs.

We conjecture that the legal environment affects information risk for the following reasons. First, the laws and regulations in place to curb insider trading affect the adverse selection risk in trading stocks. If no such laws exist or enforcement of existing laws is weak, liquidity suppliers will widen the bid-asked spreads on account of a larger informed order flow.[2] Second, the level of transparency that is required by the rules governing corporate disclosures influences information risk in securities markets. For example, firms in the United States are required by law to provide detailed disclosures around equity issuance and other corporate events. They are also governed by Rule 10(b) of the Securities Exchange Act of 1934 that makes it unlawful "to make any untrue statement of a material fact or to omit to state a material fact." In the absence of such laws, the level of disclosure will be low. Further, the quality of financial statements that is required by a country's accounting standards will have a significant bearing on the information asymmetry between inside and outside investors [Healy and Palepu (2001)]. Therefore, we hypothesize that, ceteris paribus, stocks from countries with poor insider-trading laws and disclosure requirements have high information risk and, therefore, high trading costs.

Legal institutions can also affect stock liquidity through their impact on the level of investor participation. La Porta, Lopez-De-Silanes, Shleifer, and Vishny (henceforth, LLSV) (1997, 1998) argue that the legal rules that protect investors from expropriation by insiders shape the small investors' willingness to participate in equity markets. They show that countries with weak legal institutions have narrow capital markets and concentrated inside ownership (i.e., less float) due to low participation by outside investors. The smaller float of equity and narrower equity markets will therefore lead to less depth and higher cost of liquidity. Further, investor participation depends not only on the laws in place but also on the *confidence* that they will be enforced fairly. The rule of law will prevail in the presence of a strong and independent judicial system, which in turn depends on the nature of the political system and the extent of corruption in the government. Arguably, corruption will be lower in countries with adequate checks and balances, such as in democracies or nonautocratic systems.[3] In contrast, in authoritarian and dictatorial regimes, enforcement of laws will be

[2] In support of this conjecture, Bhattacharya and Daouk (2002) find that the average cost of equity is lower in countries where insider trading laws are enforced. Theoretical expositions of the linkages between liquidity and cost of equity are made in Amihud and Mendelson (1986), Easley, Hvidkjaer, and O'Hara (2002) and O'Hara (2003).

[3] Treisman (2000) and Rose-Ackerman (2001) show that countries with longer exposure to democratic structures have lower incidence of corruption. Fisman (2001) and Johnson and Mitton (2003) present evidence that laws are not enforced fairly in Indonesia and Malaysia due to cronyism and widespread corruption.

more arbitrary, with executive powers concentrated in the hands of a privileged few. These arguments suggest that sound political institutions are vital to the development of vibrant and liquid capital markets, through the level of trust they engender.[4] Therefore, we conjecture that stocks from countries with better legal and political systems have lower trading costs due to higher investor participation.

An ideal research design to measure the impact of institutional quality will compare trading costs of *identical* securities from *different* countries that trade on *identical* market structures. Controlling for market structure is very important in light of the substantial evidence in the microstructure literature that it significantly affects trading costs [see Stoll (2000)]. In this study, we analyze trading costs of 412 American Depository Receipts (ADRs) from 44 countries that trade on the New York Stock Exchange (NYSE).

Our empirical design has several advantages. First, the sample stocks originate from countries with wide variations in institutional quality, and yet their trading costs are not affected by any variation in market structure, as all the stocks trade on the same venue (the NYSE). Clearly, if one were to compare trading costs of stocks on exchanges in different countries, it would be very difficult to control for market structure, as trading rules differ considerably in stock exchanges around the world [see Jain (2001)]. On a related note, the empirical design also helps avoid dealing with differences in non-spread costs of trading (e.g., commissions) across different exchanges.

Second, we explicitly control for the firm-level determinants of liquidity, such as market capitalization, trading volume, stock price, and volatility, in a regression framework to isolate the effect of institutional quality. We also include the proportion of trading volume executed in the home market for each ADR as a control variable in the regressions.

Third, to the extent that an ADR listing attenuates differences in disclosure practices across the sample firms, our experimental design is biased against finding a relation between institutional quality and transactions costs. Due to the stringent NYSE listing and SEC reporting standards, firms with ADRs will have better disclosure practices and hence lower trading costs than the typical firms in their home countries. This is especially true for firms from countries with weak institutions.[5] Foreign issuers are subject to U.S. securities laws concerning disclosures and procedures for equity issuances and are required to reconcile their accounting statements with U.S. GAAP (using form 20-F). Also, foreign

[4] The importance of public trust to capital markets can be seen from Lee and Ng (2005), who find that firms from more corrupt countries trade at lower values, after controlling for other factors.

[5] Doidge, Karolyi, and Stulz (2004) argue that foreign firms that list shares on U.S. exchanges have lower agency conflicts and better disclosure practices than firms that are not listed here. Lang, Lins, and Miller (2003) find that cross-listing on the U.S. exchanges improves the information environment of the firm as measured by analyst coverage and earnings forecast accuracy.

firms have to meet the listing requirements of the NYSE regarding corporate governance. For all these reasons, some studies [e.g., Coffee (1999), Stulz (1999), and Reese and Weisbach (2002)] argue that cross-listing in the U.S. serves as a substitute for weak investor protection laws in the home country, implying that the quality of home country institutions does not matter for ADR firms. However, other studies such as LLSV (2000), La Porta, Lopez-De-Silanes, and Shleifer (1999), and Siegel (2005) argue that, while issuance of ADRs improves corporate disclosures relative to home country practices, it is not an effective replacement for strong local institutions, since the U.S. laws are rarely enforced in practice. They point out that foreign issuers can obtain exemptions from various disclosure requirements of exchanges and regulators as long as the firms follow best practices in their home country. Also, Siegel (2005) documents numerous cases of securities fraud by insiders in foreign companies, where the SEC and U.S. law enforcement agencies have rarely taken action, as it is very difficult to prosecute foreign insiders across the border. Further, rules governing corporate bankruptcy and derivative actions against foreign insiders are based on the laws in the company's home country. Thus, U.S. investors have to rely on the legal systems, accounting standards, and auditor quality in the home country for both law enforcement and fraud detection.

Our evidence suggests that the quality of legal and political institutions in the home country does explain the cross section of transactions costs. The key findings are as follows. After controlling for firm-level determinants of liquidity and home country market share, the effective spread and price impact of trades (a measure of adverse selection risk) are significantly lower for stocks from countries with more efficient judicial systems, better accounting standards, and more stable political systems. Consistent with the law and finance literature, we find that trading costs are significantly higher for stocks from countries with civil law (French origin) than those with common law (English origin). The enforcement of insider-trading laws in a country as identified by Bhattacharya and Daouk (BD, hereafter) (2002), however, does not explain trading costs. Finally, in regressions with multiple institutional quality measures, we find that the *joint* explanatory power of these variables is both statistically and economically significant.

Our results are indirectly supported by Brockman and Chung (2002), who show that bid-ask spreads of China-based firms cross-listed on the Hong Kong exchange are wider than their matched pairs of Hong Kong stocks. They conjecture that this is a result of lower investor protection in China. However, for internationally cross-listed securities, many articles [e.g., see Barclay, Litzenberger, and Warner (1990)] find evidence of a "home-bias" in trading venue; that is, a high percentage of trading volume (and presumably, the pool of uninformed retail trades) is executed in the home country. This raises the possibility that the trades executed in a

foreign market are not typical for the stock. In support, several studies [see, for example, Bacidore and Sofianos (2002)] find that non-U.S. stocks that trade on the NYSE behave differently than matched U.S. stocks. They show that non-U.S. stocks have lower market quality—wider spreads and greater transitory volatility, mainly due to higher adverse selection risk. Therefore, when comparing trading costs of a cross-listed foreign security with those of a matched domestic security, it is difficult to disentangle the influence of the home-bias and of the level of investor protection, particularly when both influences are in the same direction. We circumvent this problem by comparing trading costs of only ADRs, excluding home market (U.S.) stocks in our study.

Theoretical expositions on the importance of a country's legal institutions for the development of financial markets and for corporate finance are provided in Shleifer and Wolfenzon (2002) and LLSV (2002). Several recent studies find empirical support for the predictions of these models. In brief, these studies find that firms from countries with better legal institutions are larger in terms of sales and assets [Kumar, Rajan, and Zingales (2001)], and have higher valuation relative to their assets [LLSV (2002)], lower concentration of ownership and control [La Porta et al. (1999)], and better access to external finance [Demirguc-Kunt and Maksimovic (2002)]. Also, financial markets are larger and more developed [LLSV (1997)] in countries with better legal institutions. We add to this literature by highlighting a link between the quality of institutions in a country and the cost of liquidity in financial markets.

We describe our data and discuss various measures of trading costs and institutional quality in Section 1. Section 2 presents our empirical findings on the linkage between institutional quality and trading costs. Section 3 describes additional robustness tests. We discuss unresolved issues and some directions for future research in Section 4. Section 5 summarizes the main results and conclusions of the study.

1. Variable Definitions and Data

1.1 Measures of Transactions Cost

Our first measure of transactions cost is the *quoted bid-asked spread,* which measures the cost of simultaneously executing a buy and sell order at the quotes. Intuitively, the quoted spread is the cost of demanding immediate execution [Demsetz (1968)]. The second measure, *effective spread,* is a refinement of the quoted spread. It captures price improvements on the NYSE due to executions occurring within the quoted prices and executions of larger orders outside the quoted prices. Following Lee (1993) and Bessembinder and Kaufman (1997), we calculate effective spread as:

$$\text{Percentage effective spread} = 2\times D_{it} \times (\text{Price}_{it} - \text{Mid}_{it})/\text{Mid}_{it}\times 100, \quad (1)$$

where $Price_{it}$ is the transaction price for security i at time t, Mid_{it} is the midpoint of the quoted ask and bid prices (a proxy for the "true" underlying value of the asset before the trade), and D_{it} is a binary variable that equals "1" for market buy orders and "–1" for market sell orders, determined by the algorithm used in Lee and Ready (1991).

The third measure, *price impact,* captures the market maker's assessment of the risk of inadvertently trading against superior information [Glosten and Milgrom (1985)]. The market maker incorporates the information in the order flow imbalance by permanently adjusting his quotes upwards (downwards) after a series of buy (sell) orders. Following Huang and Stoll (1996), we compute the *price impact* measure as:

$$\text{Percentage price impact} = 2 \times \mathrm{D_{it}} \times (\mathrm{V_{i,t+30}} - \mathrm{Mid_{it}})/\mathrm{Mid_{it}} \times 100, \quad (2)$$

where $V_{i,(t+30)}$ (a measure of the "true" economic value of the asset after the trade) is proxied by the midpoint of the first reported quote at least 30 minutes after the trade.[6]

1.2 Measures of Institutional Quality

LLSV (1998) argue that the differences in the laws governing investor protection imply that a similar security represents a very different bundle of rights in various countries. They attribute these differences to the legal tradition of the country. LLSV find that the countries with French civil law offer poorer investor protection than countries with common law.[7] Therefore, following LLSV (1997, 1998), we classify countries into the following legal groups: common law (English in origin) or civil law (French, German, or Scandinavian in origin). We use these classifications as one measure of the quality of legal systems. The Appendix provides a detailed description of our measures of institutional quality.

We use several measures that characterize the legal environment in a country. The *insider-trading enforcement* measure, as identified by BD (2002), is a dummy variable that indicates whether insider-trading laws have been enforced by the country's regulatory body. The *efficiency of judicial system* measure [from LLSV (1998)] is an assessment by Business International Corp., a country risk-rating agency, of the efficiency and integrity of a country's legal environment. The ratings are on a scale of 1 to 10, with low scores indicating low levels of efficiency. *Anti-director rights* is an index ranging from zero to six, compiled by LLSV (1998), which measures the ability of shareholders in a country to challenge the incumbent board of directors via proxy votes, extraordinary shareholdings

[6] To control for the arrival of additional information between time t and time (t+30), we weight the price impact by the inverse of the number of transactions between t and t+30.

[7] The civil legal tradition originates in Roman law and relies heavily on legal scholars to ascertain and formulate its rules. In contrast, common law is modeled on English law and is shaped by precedents from judicial decisions [see LLSV (1997) for further details].

meetings, preemptive rights, etc. To study the influence of *accounting standards,* we use the Center for International Financial Analysis and Research (CIFAR) index [from LLSV (1998)] that assesses the average quality of accounting statements in various countries. The index ranges from 1 to 100, with low scores indicating poor accounting standards.

A country's political institutions may be described in terms of the exposure to democracy; the stability of the government and its policies—influenced by both internal (racial/ethnic tensions) and external (war) factors; the strength and expertise of its bureaucracy; and the level of corruption, among others. We use a composite measure of *political stability,* compiled by International Country Risk Guide (ICRG), a country risk-rating agency. The measure ranges from 1 to 100, with a higher score indicating a more stable political system.

1.3 Sample Selection and Descriptive Statistics

We identify an initial sample of 516 ADRs from NYSE's non-U.S. companies' database as of May 2002. The database has information on a firm's country of incorporation and its global market capitalization in U.S. dollars. The intraday transactions data are obtained from the Trade and Quote (*TAQ*) database. Our sample period covers three months from January to March 2002. In the final sample, we eliminate stocks that (a) do not have a matching ticker in the March 2002 *TAQ* database (11 firms), (b) are not common stocks (51), (c) are incorporated in countries described as "flags of convenience" (32)[8], and (d) are not the primary common stock series for the company (10). For the final sample of 412 ADRs from 44 countries we obtain the various measures of institutional quality from the data sources described earlier. The average daily trading volume in the home country is obtained from Datastream.

Table 1, panel A, presents the sample averages by each country. Panel B shows the descriptive statistics for the overall sample. From panel A, we see that Canada, United Kingdom, and Brazil have the most NYSE listings, with 69, 46, and 32, respectively. Stocks from Finland, Taiwan, and Ireland are the most liquid in terms of daily trading volume on the NYSE. Also, firms from Japan, Spain, and Finland have, on average, the largest global market capitalizations of more than $30 billion. In contrast, the firms from the Dominican Republic or Singapore are smaller than $100 million, on average. From panel B, we note that sample firms have an overall mean (median) stock price of $32.50 ($26.50), global market capitalization of $12.16 ($3.36) billion, and daily trading volume of $5.8 ($0.50) million.

[8] Following Pulatkonak and Sofianos (1999) and Bacidore and Sofianos (2002), we classify stocks incorporated in Bahamas, Bermudas, Cayman Islands, Guernsey, Jersey, Liberia, Puerto Rico, and Netherland Antilles as "flag of convenience" stocks, as their country of incorporation is unrelated to their country of operation. These articles also present detailed discussion of the institutional framework underlying trading in NYSE cross-listed securities.

Table 1
Descriptive Statistics of the Institutional Quality Measures and Firm-Level Variables

Country	Number of ADRs	Global market cap	Stock price	Daily volume	Home market share	Legal system	Accounting quality	Insider trading	Judicial efficiency	Anti-director rights	Political stability	Quoted spreads (%)	Effective spreads (%)	Price impact (%)
Panel A: Average sample statistics for each country														
Argentina	11	1,198	12.4	577,547	0.41	Fren	45	1	6.00	4	62.5	1.95	1.55	1.03
Australia	10	12,561	45.4	2,878,693	0.95	Eng	75	1	10.00	4	88.5	0.75	0.60	0.35
Austria	1	1,426	24.8	103,249	0.96	Ger	54	0	9.50	2	89.5	0.88	0.63	0.28
Belgium	1	4,243	70.9	647,360	0.95	Fren	61	1	9.50	0	87.0	0.33	0.25	0.18
Brazil	32	3,153	28.0	4,018,498	0.55	Fren	54	1	5.75	3	62.5	0.83	0.66	0.54
Canada	69	4,232	30.9	6,937,011	0.73	Eng	74	1	9.25	5	89.5	0.44	0.36	0.23
Chile	21	983	19.3	492,302	0.52	Fren	52	1	7.25	5	77.5	1.71	1.38	0.91
China	13	5,796	22.7	533,505	0.94	—	—	0	—	—	68.0	1.08	0.86	0.45
Colombia	1	175	2.8	24,524	0.73	Fren	50	0	7.25	3	51.0	4.11	3.40	2.43
Denmark	2	9,471	40.4	349,628	0.98	Scan	62	1	10.00	2	91.0	0.65	0.52	0.32
Dominican Republic	1	85	5.3	25,568	0.00	—	—	—	—	—	66.5	1.91	1.59	1.39
Finland	4	30,518	30.9	56,933,988	0.91	Scan	77	1	10.00	3	95.0	0.60	0.46	0.29
France	20	22,698	43.8	5,237,791	0.97	Fren	69	1	8.00	3	80.5	0.73	0.60	0.46
Germany	16	27,656	52.8	5,553,944	0.67	Ger	62	1	9.00	1	87.5	0.49	0.40	0.28
Ghana	1	581	6.7	829,143	0.00	—	—	0	—	—	63.5	1.10	0.81	0.44
Greece	4	3,067	16.0	1,092,763	0.50	Fren	55	1	7.00	2	76.0	0.88	0.72	0.25
HongKong	9	7,353	13.0	1,902,616	0.82	Eng	69	1	10.00	5	80.5	2.27	1.87	1.36
Hungary	1	3,608	26.2	607,493	0.91	—	—	1	—	—	78.0	0.40	0.27	0.20
India	8	2,074	20.2	1,062,458	0.73	Eng	57	1	8.00	5	56.0	0.98	0.81	0.52
Indonesia	3	2,065	13.0	520,459	0.88	Fren	—	1	2.50	2	48.0	0.68	0.52	0.30
Ireland	4	7,314	40.4	27,897,295	0.70	Eng	—	0	8.75	4	92.0	0.46	0.35	0.21
Israel	5	244	14.4	22,263	0.59	Eng	64	1	10.00	3	58.5	2.05	1.68	0.91
Italy	11	11,638	39.9	847,953	0.67	Fren	62	1	6.75	1	81.0	1.02	0.83	0.60
Japan	17	33,195	57.3	2,289,490	0.96	Ger	65	1	10.00	4	86.0	0.60	0.50	0.27
Korea	5	16,615	36.3	11,546,086	0.84	Ger	62	1	6.00	2	76.0	0.20	0.16	0.10
Luxembourg	1	835	25.7	361,881	0.01	—	—	0	—	—	95.0	0.60	0.38	0.13
Mexico	25	2,533	19.7	5,856,734	0.52	Fren	60	0	6.00	1	68.0	1.45	1.18	0.92
Netherlands	20	22,537	34.4	9,483,462	0.70	Fren	64	1	10.00	2	94.0	0.96	0.78	0.34
New Zealand	2	2,058	13.9	248,402	0.95	Eng	70	0	10.00	4	91.0	2.15	1.81	0.63

Norway	4	7,853	23.5	2,191,278	0.84	Scan	74	1	10.00	4	89.5	0.85	0.67	0.69
Panama	3	875	26.9	1,537,695	0.00	—	—	0	—	—	73.0	0.56	0.45	0.29
Peru	3	1,038	18.2	1,537,393	0.35	Fren	38	1	6.75	3	65.0	1.59	1.26	0.79
Philippines	1	1,770	14.4	1,132,795	0.53	Fren	65	0	4.75	3	67.0	0.50	0.34	0.15
Portugal	3	7,272	22.9	230,603	0.99	Fren	36	0	5.50	3	84.5	0.91	0.76	0.33
Russia	5	1,099	31.7	3,267,747	0.37	—	—	0	—	—	61.5	0.54	0.41	0.26
Singapore	1	61	1.7	17,611	0.11	Eng	78	1	10.00	4	90.0	5.37	3.69	2.92
South Africa	3	3,072	28.8	5,609,133	0.40	Eng	70	0	6.00	5	64.0	0.34	0.29	0.21
Spain	6	31,479	22.4	3,228,005	0.98	Fren	64	1	6.25	4	82.5	0.66	0.53	0.22
Sweden	1	3,804	26.9	1,219	0.99	Scan	83	1	10.00	3	92.0	2.31	1.84	1.05
Switzerland	12	25,145	43.3	19,751,392	0.87	Ger	68	1	10.00	2	92.5	0.48	0.36	0.18
Taiwan	3	23,385	15.8	36,220,750	0.79	Ger	65	1	6.75	3	79.5	0.57	0.45	0.33
Turkey	1	443	26.2	787,139	0.96	Fren	51	1	4.00	2	58.5	0.49	0.39	0.26
United Kingdom	46	26,347	47.8	6,475,825	0.97	Eng	78	1	10.00	5	90.0	0.71	0.57	0.39
Venezuela	2	353	21.9	1,407,726	0.37	Fren	40	0	6.50	1	49.5	4.27	3.17	3.87

	N	Mean	Median	Std. Dev	Minimum	Maximum
Panel B: Overall summary statistics						
Global market capitalization	412	12,159	3,363	23,710	3	200,014
Stock price	412	32.47	26.50	25.24	0.81	190.69
Daily trading volume	412	5,800,170	552,366	19,635,040	442	225,920,266
Mid-quote volatility	411	0.06	0.02	0.20	0.01	1.97
Home market share	412	0.73	0.90	0.32	0.00	0.99
Accounting quality	380	65.37	65.00	9.83	36.00	83.00
Judicial efficiency	387	8.33	9.25	1.73	2.50	10.00
Anti-director rights	387	3.54	4.00	1.48	0.00	5.00
Political stability	412	80.23	86.00	11.87	48.00	95.00
Quoted spreads (%)	412	0.92	0.55	1.10	0.06	8.16
Effective spreads (%)	412	0.74	0.43	0.90	0.06	6.14
Price impact (%)	412	0.49	0.24	0.78	0.03	7.51

Table 1
(continued)

	Accounting quality	Insider trading	Judicial efficiency	Anti-director rights	Political stability	Inverse (Price)	Mid-quote volatility	Glob.mkt Cap	Log (Daily volume)
Panel C: Correlation matrix									
Insider trading	0.25								
	(0.00)								
Judicial efficiency	0.74	0.36							
	(0.00)	(0.00)							
Anti-director rights	0.42	0.37	0.39						
	(0.00)	(0.00)	(0.00)						
Political stability	0.72	0.36	0.80	0.26					
	(0.00)	(0.00)	(0.00)	(0.00)					
Inverse (Price)	0.12	−0.07	−0.06	0.03	−0.11				
	(0.02)	(0.17)	(0.21)	(0.49)	(0.02)				
Mid-quote volatility	−0.05	−0.13	−0.07	−0.12	−0.08	0.11			
	(0.30)	(0.01)	(0.16)	(0.02)	(0.10)	(0.02)			
Glob. mkt cap.	0.18	0.16	0.23	−0.05	0.26	−0.19	−0.10		
	(0.00)	(0.00)	(0.00)	(0.31)	(0.00)	(0.00)	(0.04)		
Log (Daily volume)	0.13	0.10	0.04	0.01	0.14	−0.38	−0.27	0.46	
	(0.01)	(0.05)	(0.38)	(0.86)	(0.00)	(0.00)	(0.00)	(0.00)	
Home market share	0.39	0.19	0.34	0.16	0.33	−0.10	−0.04	0.18	−0.21
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.43)	(0.00)	(0.00)

Panel A reports the number of firms, average global market capitalization (in $ millions), stock price, home market share, and daily trading volume by each country. The home market share variable is defined as the proportion of the trading volume executed in the home country during the sample period. Percentage quoted spread is computed as [(ask – bid) / mid × 100], where mid is the midpoint of the bid-ask quotes. Percentage effective spread is computed as [2 × dummy × (price – mid) / mid × 100], where the dummy equals one for a market buy and negative one for a market sell; price is the transaction price. Percentage price impact is computed as [2 × dummy × (Qmid30 – mid) / mid × 100], where Qmid30 is the midpoint of the first quote observed after 30 minutes. Institutional quality measures are also reported for each county in our sample. Origin of legal system, judicial efficiency, anti-director rights and CIFAR rankings are obtained from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998); the insider-trading enforcement and political stability rankings are from Bhattacharya and Daouk (2002) and International Country Risk Guide, respectively. Appendix A provides the details. Panel B shows the summary statistics for the overall sample. Mid-quote volatility is the standard deviation of returns based on mid-quote prices. Panel C presents the correlation matrix (*p*-values in the parenthesis).

From panel A of Table 1, we note that the home market share, defined as the share of trading volume executed in the home country relative to the combined trading volume in the home market and in the U.S. during the sample period, exhibits wide variation across sample countries.[9] For example, over 95% of the daily trading volume is executed in the home country in ADR firms from France, the United Kingdom, and Australia. In contrast, the NYSE executes around 50% of the trading volume in firms from Mexico, Chile, and the Philippines, and around 30% of the volume in firms from Canada, Germany, and India.

The institutional quality measures for each country in our sample are also reported in panel A. The descriptive statistics across all sample firms are reported in panel B. Insider-trading laws have been enforced in the majority (29 out of 43) of countries in our sample. The institutional quality measures vary significantly across the countries. The full sample mean (median) accounting quality measure is 65 (65), with Portugal and Sweden having the worst and best rating at 36 and 83, respectively. The mean (median) rating for the efficiency of judicial system is 8.33 (9.25) with Indonesia being the worst at 2.5, and 13 countries tied for a perfect score of 10. The anti-director rights measure has a mean (median) of 3.54 (4.00) with a range between zero, for Belgium, and five, for countries such as Canada and the United Kingdom. The mean (median) rating of political stability is 80 (86). Finland (95) and Indonesia (48) have the top and bottom rating, respectively, for political stability.

Table 1 also reports measures of transactions costs—quoted spread, effective spread, and price impact—for each country. The spreads are computed using intra-day NYSE trade and quote information from the *TAQ* database. We use filters to delete trades and quotes that are non-standard or are likely to reflect errors.[10] For the overall sample, the mean (median) effective spread is 0.74% (0.43%), and price impact is 0.49% (0.24%), with wide variations across the countries. Firms from Singapore have the widest quoted spread (5.37%) and effective spread (3.69%), and those from Venezuela have the highest adverse selection risk (3.87%). At the other extreme, stocks from Korea have quoted spread of 0.20% and effective spread of 0.16%. The correlation matrix, presented in panel C, suggests that the institutional quality measures are highly correlated with each other. In particular, we note that the correlation between accounting quality, judicial efficiency, and political stability is more than 0.70.

[9] The NYSE calculates the home market share for regulatory purposes using data from multiple sources. During our sample period, the Datastream market share estimates have a correlation of 0.92 with the NYSE estimates, thus bolstering the confidence in this measure.

[10] A trade is omitted if it is out of time sequence, coded as an error or cancellation, or an exchange acquisition or distribution, or has a nonstandard settlement, a negative trade price or, a price change (since the prior trade) of more than 10% in absolute value. A quote is deleted if it has a nonpositive bid or ask price, a negative bid-ask spread, a change in the bid or ask price of greater than 10% in absolute value, or a nonpositive bid or ask depth, or if it is provided during a trading halt or delayed opening.

Institutional quality is also positively correlated with firm size and trading volume. Moreover, countries with better institutions have a higher home market share of the total trading volume. In the next section, we investigate the link between the quality of institutions and equity trading costs.

2. Results

2.1 Preliminary Evidence

As a preliminary examination of our proposition, we test for differences in trading costs across groups that are formed by the various measures of institutional quality. Panel A of Table 2 shows the results when stocks are classified by the origin of legal system. Stocks from the French-origin countries have the highest quoted spread (1.19%), the German-origin stocks the lowest (0.51%), with the English-origin (0.78%) and Scandinavian-origin (0.85%) stocks in the middle. The effective spread and price impact measures present a similar story. Further, the trading costs of French-origin stocks are significantly higher than those of English-origin

Table 2
Trading Costs for Groups Formed by Institutional Quality Measures

	N	Quoted spread (%)	Effective spread (%)	Price impact (%)
Panel A.1: Origin of legal systems [source: LLSV (1998)]				
French origin	165	1.19	0.96	0.67
Scandinavian origin	11	0.85	0.67	0.51
German origin	54	0.51	0.41	0.24
English origin	157	0.78	0.63	0.41
		Panel A.2. Difference in Group Means (p-value)		
French vs. German origin		*(0.00)*	*(0.00)*	*(0.00)*
French vs. Scandinavian origin		*(0.32)*	*(0.31)*	*(0.51)*
French vs. English origin		*(0.00)*	*(0.00)*	*(0.00)*
Scandinavian vs. German origin		*(0.34)*	*(0.36)*	*(0.28)*
Scandinavian vs. English origin		*(0.82)*	*(0.87)*	*(0.66)*
German vs. English origin		*(0.12)*	*(0.11)*	*(0.16)*
Panel B: Accounting quality (source: CIFAR)				
Lowest quality quartile	75	1.40	1.12	0.82
Quartile 2	72	0.96	0.78	0.56
Quartile 3	93	0.93	0.76	0.45
Highest quality quartile	140	0.64	0.51	0.34
p-value of Difference (Highest vs. Lowest)		*(0.00)*	*(0.00)*	*(0.00)*
Panel C: Insider trading [source: BD (2002)]				
Markets without enforcement	65	1.23	0.99	0.71
Markets with enforcement	346	0.85	0.69	0.45
p-value of difference (with vs. without)		*(0.01)*	*(0.01)*	*(0.01)*

Table 2
(continued)

	N	Quoted spread (%)	Effective spread (%)	Price impact (%)
Panel D: Judicial efficiency [source: LLSV (1998)]				
Least efficient quartile	84	1.10	0.88	0.65
Quartile 2	79	1.22	0.98	0.69
Quartile 3	91	0.46	0.37	0.24
Most efficient quartile	133	0.94	0.76	0.46
p-value of difference (most vs. least)		*(0.22)*	*(0.25)*	*(0.05)*
Panel E: Anti-director rights [source: LLSV (1998)]				
Least rights quartile	55	1.17	0.94	0.76
Quartile 2	121	0.86	0.69	0.43
Quartile 3	55	1.05	0.84	0.52
Most rights quartile	156	0.82	0.67	0.45
p-value of difference (most vs. least)		*(0.08)*	*(0.09)*	*(0.03)*
Panel F: Political stability (source: ICRS)				
Lowest stability quartile	72	1.20	0.95	0.71
Quartile 2	80	1.27	1.02	0.69
Quartile 3	167	0.68	0.56	0.37
Highest stability quartile	93	0.81	0.65	0.37
p-value of difference (lowest vs. highest)		*(0.03)*	*(0.03)*	*(0.01)*

Average transactions cost measures for NYSE-listed non-U.S. stocks are reported by institutional quality groups. In panels B, D, E, and F, we sort countries into four groups based on their institutional quality measures. Reported in parenthesis are the *p*-values of the null hypothesis that the means of the extreme groups are equal. For each sample firm, the institutional quality reflects the ranking of the country where the firm is incorporated. Countries are grouped by origin of legal system [source: LLSV (1998)] in panel A, CIFAR rankings [LLSV (1998)] in panel B, insider-trading enforcement [BD (2002)] in panel C, judicial efficiency rankings [LLSV (1998)] in panel D, anti-director rights [LLSV (1998)] in panel E, and political stability rankings (ICRG) in panel F.

and German-origin stocks. The difference in trading costs across the other groups, however, is not statistically significant, perhaps due to the small sample size. These results are consistent with the findings in LLSV (1997, 1998) that French civil law countries offer the weakest legal protection of investor's rights against expropriation by management.

Next, we sort countries into four groups using the CIFAR index, a measure of accounting standards in a country. We hypothesize that trading costs of stocks from countries with better accounting standards will be lower due to reduced information risk. We find, in panel B of Table 2, that stocks from countries in the lowest quartile of CIFAR rankings have effective spread of 1.12% and price impact of 0.82%. The corresponding measures are significantly lower at 0.54% and 0.34% for stocks in the highest quartile. Thus, the quality of accounting statements in a country appears to affect the trading costs of stocks originating from it.

In panels C and D of Table 2, we classify countries in terms of their quality of legal enforcement. As argued earlier, stocks from countries with more efficient legal systems and better enforcement of rules should have lower adverse selection risk and trading cost. In panel C, we use BD (2002)

classifications of whether the insider-trading laws are enforced in a country. Stocks from countries that enforce insider-trading laws have effective spread of 0.69% and price impact of 0.45%. In contrast, stocks from countries that do not enforce such laws have significantly higher effective spread and price impact of 0.99% and 0.71%, respectively. In panel D, we classify countries into quartiles using the LLSV (1998) rankings of the judicial efficiency. The average effective spread and the price impact for the stocks from the least efficient countries are 0.88% and 0.65%, respectively, and 0.76% and 0.46% for those from the most efficient countries. While the average price impact of trade is significantly different between the two extreme groups, the effective spreads are not statistically distinguishable.

In panel E, the countries are grouped based on their measure of anti-director rights. LLSV (1998) documents that participation by outside investors increases with their ability to protect themselves from expropriation by corporate insiders. Because investor participation could affect stock liquidity, we predict that stocks from countries providing more anti-director rights will have lower trading costs. Of course, this effect may be more attenuated than the direct effect of laws designed to reduce information risk. The overall results in panel E suggest that trading costs are higher for countries with less shareholder rights. However, the difference between the firms in the extreme quartiles is statistically robust only for the price impact measure.

As discussed earlier, the quality of political institutions can affect investors' confidence that the rule of law will prevail in the country. We therefore hypothesize that investor participation is higher and, hence, the cost of liquidity lower as the political stability of a country increases. Consistent with this conjecture, the results in panel F of Table 2 show that stocks from countries in the lowest quartile of the ICRG rating of political stability have effective spread and price impact of 0.95% and 0.71%, respectively. In marked contrast, the stocks in the highest quartile for political stability have effective spread of 0.65% and price impact of 0.37%. The differences in the trading costs of the two extreme groups are highly significant. In panels D and F, we observe that firms in quartile 3 have lower trading costs than firms in quartile 4. One possible explanation is the lack of control for firm characteristics that also affect transaction costs. We investigate this in the next section.

2.2 Regression Analysis

The analyses thus far do not account for potential differences in the type of firms in each group. For example, there exists the possibility that the average stock in the "best institutions" group is in fact larger, has higher trading volume, or lower volatility than the average stock in the other groups. Since it is well known that such firm-level characteristics affect the cost of liquidity, it is important to control for these factors before attributing the differences in trading costs to measures of institutional quality. In Table 3 we present

Table 3
Coefficients (*p*-Values) of Regressions of Trading Cost on Each Institutional Quality Measure and Firm Characteristics

	Effective spreads (%)								Price impact (%)							
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	2.91	3.33	3.24	3.38	3.88	3.61	3.47	3.78	2.28	2.65	2.59	2.68	3.12	2.99	2.76	3.16
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
French			0.14								0.10					
			(0.02)								*(0.13)*					
German			0.07								0.03					
			(0.40)								*(0.77)*					
Scandinavian			−0.06								−0.02					
			(0.71)								*(0.93)*					
Insider trading				−0.05								−0.04				
				(0.44)								*(0.58)*				
Accounting quality					−0.01								−0.01			
					(0.00)								*(0.01)*			
Judicial efficiency						−0.03								−0.04		
						(0.06)								*(0.02)*		
Anti-director rights							−0.02								−0.02	
							(0.16)								*(0.34)*	
Political stability								−0.01								−0.01
								(0.00)								*(0.00)*
Home market share		−0.27	−0.24	−0.27	−0.15	−0.26	−0.28	−0.18		−0.24	−0.20	−0.23	−0.12	−0.18	−0.23	−0.13
		(0.00)	*(0.01)*	*(0.00)*	*(0.12)*	*(0.01)*	*(0.00)*	*(0.04)*		*(0.01)*	*(0.07)*	*(0.02)*	*(0.29)*	*(0.09)*	*(0.03)*	*(0.17)*
Inverse (price)	3.96	3.81	3.79	3.81	3.77	3.77	3.79	3.81	2.30	2.17	2.14	2.17	2.13	2.13	2.14	2.17
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Mid-quote volatility	0.28	0.23	0.18	0.23	0.20	0.18	0.17	0.22	0.30	0.26	0.28	0.25	0.29	0.28	0.27	0.25
	(0.03)	*(0.07)*	*(0.17)*	*(0.07)*	*(0.13)*	*(0.17)*	*(0.19)*	*(0.07)*	*(0.03)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.05)*	*(0.07)*	*(0.07)*	*(0.07)*
Glob. mkt. cap.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.03)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.10)*	*(0.02)*	*(0.03)*	*(0.02)*	*(0.02)*	*(0.01)*	*(0.03)*	*(0.01)*

Table 3
(continued)

	Effective spreads (%)								Price impact (%)							
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (daily volume)	−0.19	−0.21	−0.20	−0.21	−0.20	−0.21	−0.21	−0.20	−0.15	−0.17	−0.17	−0.17	−0.16	−0.17	−0.17	−0.16
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Adj R^2	69.4%	70.0%	71.0%	70.0%	71.8%	70.9%	70.8%	70.9%	46.7%	47.4%	47.4%	47.0%	48.4%	48.1%	47.5%	48.8%
N	411	411	386	410	379	386	386	411	411	411	386	410	379	386	386	411

Reported are coefficients from regressions of transactions cost measures on each institutional quality variables and firm characteristics for a sample of NYSE-listed non-U.S. stocks; *p*-values are reported in parenthesis. The intraday transactions data are from Trade and Quote (TAQ) database. The sample period covers three months from January to March 2002. The transactions cost measures are effective spreads and price impact of trades, in percentage points. Percentage effective spread is computed as [2 × dummy × (price – mid) / mid × 100], where the dummy equals one for a market buy and negative one for a market sell; price is the transaction price. Percentage price impact is computed as [2 × dummy × (Qmid30 – mid) / mid × 100], where Qmid30 is the midpoint of the first quote observed after 30 minutes. For each sample firm, the institutional quality reflects the ranking of the country where the firm is incorporated. The measures (and data sources) are judicial efficiency [LLSV (1998)], anti-director rights [LLSV (1998)], CIFAR rankings [LLSV (1998)], insider-trading enforcement [BD (2002)], and political stability rankings (ICRG). For each firm, the inverse of the average stock price, standard deviation of daily returns based on quote midpoints, global market capitalization, the log of daily NYSE trading volume, and home market share of trading volume serve as firm level controls.

regression models of trading cost measures, which account for the influence of firm characteristics. The benchmark regression specification, model 1, includes firm characteristics such as the inverse of stock price, the standard deviation of daily stock returns based on the midpoint of closing quotes, the global market capitalization of the ADR firm, and the log of daily NYSE trading volume as control variables.[11] Consistent with the prior literature [see Stoll (2000)], we find that trading costs increase with return volatility and inverse of stock price, and decrease with trading volume.

In model 2, we present the benchmark specification for ADR firms, which includes the home country market share of the total trading volume as an additional control variable. The home market share could affect trading costs of ADRs in two possible ways. The theoretical analysis in Chowdry and Nanda (1991) predicts that, when the home market attracts a significant amount of order flow, trading costs of ADRs would be higher due to negative trading externalities. Alternatively, a significant trading volume in the home market may lead liquidity providers in the NYSE to narrow spreads on account of more intense competition for order flow.[12] Moreover, trading costs could be lower for ADRs with a higher home market share for another reason: order flow likely moves to home markets with stock exchanges that offer better transactional efficiencies, and reliable clearance and settlement systems. That is, home market share may, in fact, indirectly proxy for the quality of institutions in a country. Nevertheless, as a robustness test, we include home market share as a control variable in the regressions. The negative coefficient (p-value of 0.00) is consistent with the notion that significant liquidity in the home market exerts competitive pressure on the NYSE traders to post narrower spreads. Alternatively, because of the high positive correlation between home market share and institutional quality documented earlier (Table 1, panel C), the result implies that firms from countries with better institutions have lower transactions costs.

Models 3 through 8 suggest that the general conclusions we obtained earlier, using group-level averages, continue to hold. After controlling for firm-level characteristics, stocks from French civil law countries have significantly higher effective spread (by 14 basis points) than stocks from common law countries (model 3). Similarly, effective spread and price impact of trades are significantly lower for stocks from countries with better accounting quality (model 5), more efficient judicial systems (model 6), and with higher political stability (model 8). In model 7, the negative coefficient, although not statistically significant, indicates that

[11] As robustness checks, we ran regressions after controlling for average trade size and average trades per day (and log transformation of these variables and of global market capitalization) and found similar results.

[12] We thank the referee for pointing us in this direction. See Domowitz, Glen, and Madhavan (1998) and Foerster and Karolyi (1998) for empirical evidence on the effect of intermarket competition.

countries with better anti-director rights have lower trading costs. Also, the dummy variable for insider-trading enforcement in model 4 is not statistically significant. One explanation is that insiders in non-U.S. stocks prefer to trade in the home country, since insider-trading surveillance systems are likely better in the NYSE than in the home exchange. Alternatively, the dummy variable is a blunt measure of the quality of insider-trading enforcement across countries. One result from Table 3 is particularly noteworthy. In the presence of institutional quality variables, the coefficient on return volatility is only marginally significant at best. This does suggest that ex-ante macro-risk measured by the institutional quality accounts, at least in part, for firm-level return volatility. This is a new result, to the best of our knowledge.

The results thus far suggest that macro-level institutions affect the cost of liquidity in equity markets. This new finding adds to the existing literature that primarily focuses on firm-level characteristics and on stock market structure as determinants of stock liquidity. The results therefore imply that any improvement in macro institutions will reduce trading costs and thereby increase stock market valuation, as suggested by Amihud and Mendelson (1986), Eleswarapu (1997), and Easley, Hvidkjaer, and O'Hara (2002).

In Table 4, we extend our regression analysis by including more than one institutional quality variable in the models. In models 1 and 2, the judicial efficiency variable loses explanatory power in the presence of either accounting quality or political stability. In contrast, both accounting quality and political stability have significant influence on trading costs in these models. When we include accounting quality and political stability variables together (model 3), political stability continues to explain variations in effective spread (p-value of 0.03) and price impact (p-value of 0.00), while the accounting quality variable loses significance. In models 4 and 5, where political stability and accounting quality are included, the insider-trading enforcement and anti-director rights variables have no significant explanatory power.

Finally, in model 6, when we include all institutional quality variables in the same regression, the political stability variable continues to be highly significant. Evidence on the accounting quality variable is mixed, as it is significant only in the effective spread regression. The insider-trading variable remains insignificant, and the sign of the coefficient of judicial efficiency variable has flipped. The reduced significance of a given institutional variable, as compared to the results in Table 3, is not surprising, however, in light of the high correlation among the institutional quality variables noted earlier (Table 1, panel C). Thus, a more important question is whether the combined influence of these measures on transactions costs is significant. We therefore test for the null hypothesis that all institutional quality variables are jointly equal to zero. The joint F-tests,

Table 4
Coefficients (*p*-Values) of Regressions of Trading Costs on Multiple Institutional Quality Measures and Firm Characteristics

	Effective spreads (%)						Price impact (%)					
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.87	3.94	4.08	4.09	4.08	4.15	3.16	3.34	3.44	3.45	3.43	3.49
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Insider trading				−0.05		−0.10				−0.06		−0.09
				(0.59)		*(0.33)*				*(0.56)*		*(0.45)*
Accounting quality	−0.01		−0.01	−0.01	−0.01	−0.01	−0.01		0.00	−0.00	0.00	−0.00
	(0.00)		*(0.17)*	*(0.17)*	*(0.23)*	*(0.05)*	*(0.22)*		*(0.98)*	*(0.98)*	*(0.96)*	*(0.68)*
Judicial efficiency	0.01	0.04				0.06	−0.03	0.03				0.03
	(0.65)	*(0.13)*				*(0.03)*	*(0.31)*	*(0.32)*				*(0.31)*
Anti-director rights					−0.00	−0.01					−0.00	−0.00
					(0.83)	*(0.81)*					*(0.84)*	*(0.93)*
Political stability		−0.01	−0.01	−0.01	−0.01	−0.01		−0.01	−0.01	−0.01	−0.01	−0.01
		(0.00)	*(0.03)*	*(0.04)*	*(0.03)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Home market share	−0.15	−0.30	−0.13	−0.12	−0.13	−0.12	−0.11	−0.12	−0.08	−0.08	−0.08	−0.07
	(0.12)	*(0.03)*	*(0.20)*	*(0.21)*	*(0.20)*	*(0.22)*	*(0.32)*	*(0.25)*	*(0.48)*	*(0.50)*	*(0.48)*	*(0.51)*
Inverse (price)	3.77	3.75	3.77	3.76	3.77	3.74	2.13	2.11	2.12	2.11	2.13	2.10
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Mid-quote volatility	0.20	0.20	0.19	0.18	0.19	0.20	0.28	0.30	0.28	0.27	0.28	0.28
	(0.12)	*(0.12)*	*(0.15)*	*(0.17)*	*(0.16)*	*(0.14)*	*(0.07)*	*(0.05)*	*(0.06)*	*(0.08)*	*(0.07)*	*(0.07)*
Glob. Mkt. Cap.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*
Log (daily volume)	−0.20	−0.20	−0.20	−0.20	−0.20	−0.20	−0.17	−0.16	−0.16	−0.16	−0.16	−0.16
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Adj R^2	71.7%	71.7%	72.1%	72.0%	71.9%	72.2%	48.4%	49.3%	49.6%	49.5%	49.4%	49.4%
N	379	386	379	379	379	379	379	386	379	379	379	379
Institutional quality												
joint *F*-test	7.01	7.83	9.42	6.36	6.28	4.86	4.2	7.63	8.62	5.85	5.74	3.71
p-value	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*

Reported are coefficients from regressions of transactions cost measures on multiple institutional quality variables and firm characteristics for a sample of NYSE-listed non-U.S. stocks; *p*-values are reported in parenthesis. Also reported are the *F*-statistics and *p*-values of the null hypothesis that all the institutional quality variables are jointly equal to zero. The intraday transactions data are from Trade and Quote (TAQ) database. The sample period covers three months from January to March 2002. The transactions cost measures are effective spreads and price impact of trades, in percentage points. For each sample firm, the institutional quality reflects the ranking of the country where the firm is incorporated. The measures (and data sources) are judicial efficiency [LLSV (1998)], anti-director rights [LLSV (1998)], accounting quality [LLSV (1998)], insider-trading enforcement [BD (2002)], and political stability rankings (ICRG). For each firm, the inverse of the average stock price, standard deviation of daily stock returns based on closing quote midpoints, global market capitalization of the ADR firm, the log of the daily NYSE trading volume, and the home market share of trading volume serve as firm level controls.

reported in the last row, strongly reject the null at the 5% level in every specification. These robust findings support our basic thesis that stocks of countries with better ratings for institutional quality are rewarded with higher liquidity.

3. Tests of Robustness

In this section, we perform robustness checks to test for other possible explanations of our results. We conduct two types of analyses. First, we include several variables as additional controls to ensure that institutional variables are not merely proxying for omitted country-level variables. Second, we replicate our entire analysis using the trading costs of ADR firms measured as differences relative to their matched pairs among U.S. stocks.

3.1 Country-Specific Control Variables

Table 5 shows the results from regressions that include several country-specific variables. Model 1 includes a dummy variable that equals one when the ADR firm is from an emerging market. To capture potential continent effects, we also include four continent dummies—one each for Latin America, Asia, Europe, and Africa, with North America serving as the base case. Bacidore and Sofianos (2002) find that trading costs are higher for ADR firms from emerging markets. In results not reported in our article, we also find that the emerging market dummy is highly significant, when institutional variables are not included in the regressions. However, in the presence of institutional variables (model 1), the emerging market effect is insignificant. In contrast, the *F*-test of the joint explanatory power of institutional variables in model 1 remains highly significant, both in the effective spread and price impact regressions. This suggests that institutional variables contain relevant

Table 5
Coefficients (*p*-Values) of Regressions of Trading Costs on Institutional Quality Measures, Firm Characteristics and Country-Level Variables

	Effective spreads (%)				Price impact (%)			
Dependent variable	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Intercept	3.61	4.08	4.18	4.66	3.05	3.78	3.63	3.96
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Insider trading	−0.21	−0.09	−0.12	−0.13	−0.23	−0.04	−0.11	−0.11
	(0.08)	*(0.42)*	*(0.23)*	*(0.20)*	*(0.10)*	*(0.74)*	*(0.36)*	*(0.35)*
Accounting quality	−0.00	−0.01	−0.01	−0.01	0.01	−0.00	−0.00	−0.01
	(0.79)	*(0.29)*	*(0.03)*	*(0.01)*	*(0.29)*	*(0.88)*	*(0.50)*	*(0.37)*
Judicial efficiency	0.08	0.09	0.06	0.06	0.01	0.07	0.02	0.03
	(0.01)	*(0.02)*	*(0.04)*	*(0.04)*	*(0.06)*	*(0.13)*	*(0.48)*	*(0.40)*

Table 5
(continued)

	Effective spreads (%)				Price impact (%)			
Dependent variable	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Anti-director rights	−0.01	−0.01	0.00	0.01	−0.02	−0.02	0.01	0.01
	(0.76)	*(0.86)*	*(0.90)*	*(0.60)*	*(0.47)*	*(0.65)*	*(0.71)*	*(0.58)*
Political stability	−0.01	−0.02	−0.01	−0.02	−0.02	−0.02	−0.01	−0.02
	(0.01)	*(0.00)*	*(0.01)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Home market share	−0.13	−0.13	−0.12	−0.15	−0.05	−0.07	−0.05	−0.10
	(0.21)	*(0.18)*	*(0.24)*	*(0.14)*	*(0.64)*	*(0.51)*	*(0.68)*	*(0.40)*
Inverse (price)	3.75	3.72	3.74	3.75	2.12	2.10	2.12	2.11
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Mid-quote volatility	0.18	0.17	0.19	0.18	0.27	0.26	0.25	0.27
	(0.16)	*(0.20)*	*(0.16)*	*(0.16)*	*(0.08)*	*(0.10)*	*(0.11)*	*(0.08)*
Glob. Mkt. Cap.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.02)*	*(0.02)*	*(0.01)*	*(0.02)*
Log (daily volume)	−0.19	−0.20	−0.19	−0.20	−0.16	−0.16	−0.16	−0.16
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Emerging market	0.08				0.01			
	(0.52)				*(0.97)*			
Europe	0.15				0.06			
	(0.06)				*(0.52)*			
Latin America	0.22				0.29			
	(0.12)				*(0.08)*			
Asia	0.06				−0.00			
	(0.58)				*(0.99)*			
Africa	−0.26				−0.46			
	(0.20)				*(0.05)*			
Romance		0.08				−0.01		
		(0.52)				*(0.93)*		
Germanic		0.04				−0.03		
		(0.81)				*(0.88)*		
Japanese/Chinese		0.14				0.07		
		(0.23)				*(0.60)*		
Other languages		−0.24				−0.44		
		(0.12)				*(0.01)*		
Industry fixed effects			Yes				Yes	
Stock market turnover				0.00				0.00
				(0.23)				*(0.45)*
Log (GDP per capita)				0.08				0.09
				(0.23)				*(0.25)*
Adj R^2	72.6%	72.6%	72.4%	72.4%	50.2%	50.4%	50.0%	49.4%
N	379	379	379	379	379	379	379	379
Institutional quality								
joint *F*-test	2.42	3.5	4.88	4.17	2.78	3.64	4.26	2.63
p-value	*(0.04)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.02)*

Reported are coefficients from regressions of transactions cost measures on multiple institutional quality variables, firm characteristics, and country-level variables for a sample of NYSE-listed non-U.S. stocks; *p*-values are reported in parenthesis. Also reported are the *F*-statistics and *p*-values of the null hypothesis that all the institutional quality variables are jointly equal to zero. The intraday transactions data are from Trade and Quote (TAQ) database. The sample period covers three months from January to March 2002. The transactions cost measures are effective spreads and price impact of trades, in percentage points. For each sample firm, the institutional quality reflects the ranking of the country where the firm is incorporated. The measures (and data sources) are judicial efficiency [LLSV (1998)], anti-director rights [LLSV (1998)], accounting quality [LLSV (1998)], insider-trading enforcement [BD (2002)], and political stability rankings (ICRG). For each firm, the inverse of the average stock price, standard deviation of daily stock returns based on closing quote midpoints, global market capitalization of the ADR firm, the log of the daily NYSE trading volume, and the home market share of trading volume serve as firm level controls. Emerging market (Continent) dummy equals one when the firm originates from emerging market (a particular Continent), and equals zero otherwise. The language family dummy equals one when the country from which the firm originates belongs to the language family, and equals zero otherwise (source: *Wikipedia Encyclopedia*). Firms are classified into 12 industry groups based on Fama and French's 12-industry classification. GDP per capita and stock market turnover (trading volume/market capitalization) data for sample countries are obtained from 2002 *World Development Indicators Factbook,* published by the World Bank.

information about a country beyond its classification as an emerging or developed market.

Next, we explore the potential impact of a country's language on trading costs.[13] The sample countries are classified into the following major language families—Anglo-Saxon, Romance, Germanic, Japanese/Chinese, and others (as identified in *Wikipedia Encyclopedia*). Model 2 includes dummy variables indicating the language families, where the Anglo-Saxon family serves as the base case. Again, we find that after controlling for language effects the joint explanatory power of the institutional quality variables remains robust.

Next, we classify the sample firms into Fama-French's 12 industry groups and estimate a regression that includes 11 industry dummies. Since industry clustering could differ across sample countries, this specification would ensure that the institutional quality variables are not mere proxies for industry effects. From model 3, we see that the joint explanatory power of institutional variables remains highly significant even in models that control for industry effects.

Finally, in model 4 we include stock market turnover (defined as the ratio of total trading volume in 2002 and the stock market capitalization at the end of 2002) and logarithm of GDP per capita in 2002 in the country of origin for each stock. The data for these two variables are obtained from *2002 World Development Indicators Fact Book*. In the presence of institutional measures, neither market turnover nor GDP per capita explains trading costs. In contrast, the explanatory power of the institutional variables remains robust. Overall, we conclude from the analysis in Table 5 that institutional variables are not merely proxying for omitted variables in earlier specifications.

In addition to the analyses in Table 5, we study the effect of several other country-specific variables but do not report them for the sake of brevity. Pulatkonak and Sofianos (1999) find that the NYSE's share of global trading is higher for foreign stocks from countries that are closer to the New York time zone. This is because ADRs from most countries, with the exception of Canada, are not fungible (i.e., ADR certificates cannot be sold in the home exchange of the stock). So, if home market and New York trading sessions do not overlap, U.S. investors in ADRs cannot trade on information produced in the home market until the opening of NYSE, thus placing them at a relative disadvantage. To control for the time zone effect, we follow the approach in Pulatkonak and Sofianos (1999) and include eight time-zone dummy variables in our regressions. These eight time-zones are based on the time-difference between New York and the home country, measured in 3-hour blocks. The time-zone variables have no explanatory power, and the results do not change,

[13] We thank the referee for suggesting this line of investigation.

suggesting that the firm's trading volume and home country market share may be adequate controls for the time-zone effect in the regressions.

We also reestimate all the regressions in Tables 3 and 4 accounting for country random effects. In a random effect specification, the standard errors are adjusted to account for country-level cross correlation due to common country components. We can view the common variation within a country as the influence of a collection of factors specific to a country that are not included in the regressions. All our results are unchanged in the models with random effects. Note the wide variations in the number of ADR listings from different countries in Table 1. This raises the possibility that countries with large listings mainly drive the results of the regressions. As a check, we estimate the regressions using country-specific averages of trading cost measures, firm characteristics and institutional quality measures. Despite the small sample size, the results do not change qualitatively.

3.2 Matched Analysis

In their study of specialist participation for ADR firms, Bacidore and Sofianos (2002) use an experimental design that analyzes the *differential* trading cost of ADR stock relative to a matched U.S. stock. In this section, we study whether our results are robust to this alternative design. For each ADR stock, we select an NYSE-listed U.S. stock, matched on industry, stock price, market capitalization, and daily return volatility. The industry classification is based on Fama-French's 12 industry groups. Among all potential industry matched firm-pairs, the U.S. firm is selected by minimizing the following distance measure:

$$\sum_{i=1}^{3}\left(\frac{X_i^{U.S}-X_i^{ADR}}{\left((X_i^{U.S.}+X_i^{ADR})/2\right)}\right)^2 \tag{3}$$

where X_i is the value of the ith matching variable—stock price, market capitalization, or return volatility. The stock price and market capitalization are as of March 31, 2002. The daily return volatility is measured over the sample period January–March 2002.

We next compute the *differential* trading cost measure, defined as the ADR trading cost minus the matched U.S. trading cost. In a preliminary analysis, we find that effective spreads of ADR stocks are higher than matched U.S. stocks by 0.43% (median of 0.25%), both significant at the 1% level; the differential price impact of trades is 0.28% (median of 0.10%), both significant at the 1% level. These results are similar to Bacidore and Sofianos (2002), who find that effective spreads and price impact of ADR firms are higher than matched U.S. firms by 0.32% and 0.24%, respectively, in an earlier time period.

Next, we analyze the differential trading costs in regression specifications similar to the ones in Tables 3 and 4. Here we include the differences (Δ) between the firm characteristics of ADR firms and their matched U.S. pairs as control variables to account for any residual differences. Table 6 shows the results of these regressions. Model 1 presents the base-case regression without the institutional variables. In model 2 we see that, consistent with earlier results, the differential effective spreads and price impact are significantly higher for stocks from French-based legal systems than those from common-law countries.

When we consider each of the institutional variables in models 3 through 7, we obtain results similar to those from Table 3. Accounting quality, judicial efficiency, and political stability have significant effect on the differential trading costs of the ADR firms. The influence of the insider-trading variable is weak, as noted earlier. Also, the anti-director rights variable does not explain the differential trading costs. Model 8 includes all the institutional quality variables in the regression. Here we find the joint explanatory power of these variables is highly significant in both the differential effective spread and differential price impact regressions. That is, the differences between trading costs of ADR stocks and their matched U.S. stocks are correlated with institutional quality. Thus, the key results and conclusions continue to hold in this alternative experimental design.

4. Unresolved Issues

The "law and finance" literature has documented that outside investors are more likely to participate in financial markets and are willing to pay more for financial assets when the legal system better protects their rights by reducing the risk of expropriation by insiders [see LLSV (2002), Lee and Ng (2005)]. The resultant impact of macro institutions on firm valuation is easy to see. But the exact mechanism by which institutions influence trading costs, as documented in our article, is not as obvious.

We conjecture that macroinstitutions affect the cost of liquidity through their impact on information risk and investor participation. When outside investors are unwilling to participate in equity markets, either because weak legal systems fail to protect them from expropriation [LLSV (1999)] or because authoritarian political systems fail to fairly enforce laws and regulations, the proportion of informed and uninformed traders in capital markets is significantly altered. Also, traders have more incentives to acquire private information in countries where accounting standards are low and information asymmetry between inside and outside investors is high. Similarly, lax enforcement of insider-trading laws diminishes investor confidence and increases the risk of informed trading. In sum, the cost of providing liquidity would be higher for firms from countries with weak macro institutions due to larger informed order flow.

Table 6
Coefficients (*p*-Values) of Regressions of *Differential* Trading Cost on Institutional Quality Measures and *Differential* Firm Characteristics

	Δ Effective spreads (%)								Δ Price impact (%)							
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.18	0.04	0.28	0.99	0.59	0.25	0.94	1.33	0.13	0.01	0.20	0.84	0.52	0.18	0.94	1.32
	(0.00)	*(0.59)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.07)*	*(0.90)*	*(0.03)*	*(0.00)*	*(0.00)*	*(0.08)*	*(0.00)*	*(0.00)*
French		0.21								0.16						
		(0.00)								*(0.03)*						
German		−0.09								−0.11						
		(0.22)								*(0.26)*						
Scandinavian		−0.07								−0.01						
		(0.66)								*(0.95)*						
Insider trading			−0.14					−0.20			−0.12					−0.21
			(0.04)					*(0.04)*			*(0.12)*					*(0.08)*
Accounting quality				−0.01				−0.01				−0.01				−0.01
				(0.00)				*(0.00)*				*(0.00)*				*(0.19)*
Judicial efficiency					−0.06			0.04					−0.06			0.05
					(0.00)			*(0.16)*					*(0.00)*			*(0.16)*
Anti-director rights						−0.02		0.03						−0.02		0.02
						(0.33)		*(0.18)*						*(0.40)*		*(0.47)*
Political stability							−0.01	−0.01							−0.01	−0.01
							(0.00)	*(0.01)*							*(0.00)*	*(0.00)*
Home market share	−0.35	−0.25	−0.32	−0.17	−0.27	−0.35	−0.23	−0.17	−0.25	−0.13	−0.21	−0.05	−0.13	−0.21	−0.13	−0.04
	(0.00)	*(0.01)*	*(0.00)*	*(0.08)*	*(0.05)*	*(0.00)*	*(0.01)*	*(0.09)*	*(0.02)*	*(0.28)*	*(0.06)*	*(0.68)*	*(0.26)*	*(0.08)*	*(0.24)*	*(0.77)*
Δ *Inverse (price)*	3.55	3.36	3.53	3.38	3.46	3.55	3.48	3.28	1.99	1.95	2.09	1.96	2.03	2.12	1.91	1.88
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Δ *Mid-quote volatility*	0.53	0.43	0.50	0.47	0.46	0.48	0.49	0.45	0.54	0.52	0.50	0.56	0.54	0.56	0.50	0.51
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*

Table 6
(continued)

	Δ Effective spreads (%)								Δ Price impact (%)							
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ *Glob. Mkt. Cap.*	0.00	0.00	0.00	−0.00	0.00	0.00	0.00	−0.00	0.00	0.00	−0.00	−0.00	0.00	0.00	−0.00	−0.00
	(0.87)	*(0.81)*	*(0.92)*	*(0.96)*	*(0.83)*	*(0.85)*	*(0.99)*	*(0.87)*	*(0.96)*	*(0.90)*	*(0.99)*	*(0.92)*	*(0.92)*	*(0.94)*	*(0.91)*	*(0.85)*
Δ *Log (daily volume)*	−0.15	−0.15	−0.15	−0.14	−0.15	−0.15	−0.15	−0.15	−0.10	−0.09	−0.10	−0.09	−0.10	−0.09	−0.10	−0.10
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Adj R^2	37.0%	40.2%	37.4%	41.5%	39.5%	37.4%	40.7%	42.9%	14.8%	15.9%	15.2%	17.5%	16.5%	15.9%	18.8%	20.0%
N	411	379	410	379	386	386	411	379	411	379	410	379	386	386	411	379
Institutional quality																
joint *F*-test	n.a.	7.23	4.45	27.98	14.75	0.96	26.63	8.49	n.a.	3.08	2.40	14.36	9.42	0.71	20.98	6.12
p-value		*(0.00)*	*(0.04)*	*(0.00)*	*(0.00)*	*(0.33)*	*(0.00)*	*(0.00)*		*(0.03)*	*(0.12)*	*(0.00)*	*(0.00)*	*(0.40)*	*(0.00)*	*(0.00)*

Reported are coefficients from regressions of *differential* transactions cost measures on institutional quality variables and differential firm characteristics for a sample of NYSE-listed non-U.S. stocks; *p*-values are reported in parenthesis. The *differential* transactions cost (firm characteristic) is calculated for each ADR stock relative to a matched U.S. stock. Each ADR stock is matched with an NYSE-listed U.S. stock based on industry, stock price, market capitalization and daily return volatility. The transactions cost measures are effective spreads and price impact of trades, in percentage basis points. For each sample firm, the institutional quality reflects the ranking of the country where the firm is incorporated. The measures (and data sources) are efficiency of judicial system rankings [LLSV (1998)], anti-director rights [LLSV (1998)], CIFAR rankings [LLSV (1998)], insider-trading enforcement [BD (2002)), and political stability rankings (ICRG). The inverse of the average stock price, standard deviation of daily returns based on quote midpoints, global market capitalization, the log of daily NYSE trading volume, and home market share of trading volume serve as firm level controls.

There is corroborating evidence in Bacidore and Sofianos (2002) which shows that, for stocks from emerging markets, the overnight inventory positions of the NYSE specialists are lower and the specialist stabilization rates smaller, because these stocks have higher risk of adverse selection.

Although our study documents the empirical relation between macro-institutions and liquidity costs, the evidence here is only suggestive. There are several issues and puzzles that remain unaddressed. For example, the exact mechanism of how the NYSE specialists (and other liquidity providers) take into account the risks of poor institutions while quoting bid and ask prices over a short interval is not very clear. In support of our story, do stocks from emerging markets have a larger proportion of informed traders [using the measure proposed by Easley et al (2002)] than stocks from developed market? Do firms from countries with strong institutions have more retail (uninformed) order flow? Similarly, do macro institutions drive differences in other measures of information asymmetry, such as analyst coverage and institutional ownership? Why do we observe such a strong effect of political stability on the cost of liquidity? Given the low levels of inventory held overnight by NYSE specialists, the short-term inventory risk should not be materially affected by political stability. An equally intriguing question is why firm-specific volatility loses significance in explaining trading costs in the presence of macro variables. Clearly, there are many unanswered questions that arise from the results in our article. We believe that these are interesting avenues for future research.

5. Summary and Conclusions

This study presents a link between the growing literature emphasizing the importance of macro institutions and the vast microstructure literature on the determinants of trading costs. Prior studies on the determinants of trading costs have focused either on firm-level characteristics or on stock market structure. We contribute to this literature by documenting that macro institutions also significantly affect the cost of liquidity in equity markets. Specifically, after controlling for firm-level determinants of liquidity, we find that trading costs are lower for stocks from countries with better ratings for judicial efficiency, accounting standards, and political stability. Consistent with the law and finance literature, we find that the trading costs are significantly higher for stocks from French civil law countries than from common law countries. We thus present a new benchmark model for trading cost analysis in the international context.

The results are robust in various sensitivity analyses. We include country-specific control variables such as an emerging market dummy variable, stock market turnover, GDP per capita of the home country, and language family dummies. We also estimate regressions that control for industry

fixed effects, time zone effects, and country random effects. In addition, we use an alternative empirical design, following Bacidore and Sofianos (2002), and analyze the differential trading costs of ADR firms measured relative to matched U.S. stocks. Again, we find that these differential trading costs are related to the quality of macro institutions in the country.

Our study contributes to the current debate on whether foreign firms can entirely overcome weak institutions in the home country by cross-listing in the U.S. markets. While recent studies [e.g., Doidge, Karolyi, and Stulz (2004), Lang, Lins, and Miller (2003)] show that cross-listing on U.S. exchanges improves corporate disclosure, the results here suggest that cross-listing is not an effective replacement for strong institutions in the home country—local institutions do matter for NYSE-listed non-U.S. stocks.

In conclusion, our study adds to the growing body of evidence on the economic consequences of weak institutions. Prior research has shown that firms from countries with weak institutions have lower valuation and higher required return on equity. Our results suggest that macroinstitutions also affect firm valuation and expected return through their impact on stock market liquidity. We thus present another piece of evidence toward a better understanding of the benefits of improving a country's institutions.

Appendix

Description of the Legal, Accounting, and Political System Variables

Variable	Description	Sources
Legal origin	"Identifies the legal family or tradition of the company law or commercial code to which a country belongs" [Reynold and Flores (1989)]. Broadly classified as either common law (English in origin) or civil law (French, German, or Scandinavian in origin).	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997)
Insider-trading enforcement	Equals one if there has been an incident of prosecution under insider-trading laws, based on responses to a survey of national regulators and officials of stock exchanges in March 1999, and zero otherwise.	Bhattacharya and Daouk (2002)
Efficiency of judicial system	"Assessment of the 'efficiency and integrity of the legal environment as it affects business, particularly foreign firms' produced by the country risk rating agency Business International Corp. It 'may be taken to represent investors' assessments of conditions in the country in question.' Average between 1980 and 1983. Scale from zero to 10; with lower scores, lower efficiency levels."	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)
Accounting standards	"Index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items by Center for International Financial Analysis and Research (CIFAR). These items fall into seven categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). A minimum of three companies in each country was studied. The companies represent a cross section of various industry groups; industrial companies represented 70 percent, and financial companies represented the remaining 30 percent. Scale from zero to 100; lower scores indicate low accounting standards."	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)

Appendix
(continued)

Variable	Description	Sources
Anti-director rights	"The index is formed by adding 1 when (1) the country allows shareholder to mail their proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholders' meeting, (3) cumulative voting or proportional representation of minorities in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than equal to 10 percent (the sample median), or (6) shareholder have preemptive rights that can be waived only by a shareholders' vote. The index ranges from zero to six."	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)
Political stability	"Assessment of the 'political stability of the countries on a comparable basis,' by assigning risk points to a pre-set group of risk components as of January 2002. The minimum number of points assigned to each component is zero, while the maximum number of points is a function of the components' weight in the overall political stability assessment. The risk components (and maximum points) are: government stability (e.g., popular support) (12), socioeconomic conditions (e.g., poverty) (12), investment profile (e.g., expropriation) (12), internal conflict (e.g., terrorism or civil war) (12), external conflict (e.g., war) (12), corruption (6), military in politics (6), religion in politics (6), law and order (6), ethnic tensions (6), democratic accountability (6) and bureaucracy quality (4). Scale from zero to 100; low scores indicate low political stability."	International Country Risk Guide

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