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WP 2009-24
June 2009

Working Paper

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When No Law is Better than a Good Law

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When No Law is Better Than a Good Law*

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Abstract. This paper argues, both theoretically and empirically, that sometimes no securities law may be better than a good securities law that is not enforced. The first part of the paper formalizes the sufficient conditions under which this happens for any law. The second part of the paper shows that a specific securities law - the law prohibiting insider trading - may satisfy these conditions. The third part of the paper takes this prediction to the data. We find that the cost of equity actually rises when some countries enact an insider trading law, but do not enforce it.

First version: June 2004
This version: April 2009

JEL Classification: G15, G18, K22, K42
Keywords: insider trading; cost of capital; emerging markets; securities law; enforcement

* We thank Arturo Bris, Stijn Claessens, Michel Habib, Geoff Miller, Randall Morck, Kazuhiko Ohashi, Paul Tetlock, Sheridan Titman, John Wald and participants in the seminars or conferences at the 2008 American Finance Association Meetings in New Orleans, Bank of Japan, Case Western Reserve University, French Finance Association Meeting, Goethe University, Harvard Law School, Hebrew University, Hitotsubashi University, Indiana University, Istanbul Stock Exchange, KOC, McMaster University, MIT, Purdue University, Rice University, Sabanci University, Shanghai Conference on Corporate Governance, Southern Methodist University, Stockholm School of Economics, Tel Aviv University, Texas A&M University, University of Alberta, Universidad de San Andres, Universidad

Torcuato di Tella, UC Riverside, UT Austin, UT Dallas, University of Hohenheim, University of Iowa, University of Lugano, University of Missouri-Columbia, UT San Antonio, University of Tokyo, University of Toronto, University of Waterloo, World Bank and Yokohama University for improving the paper. Special thanks go to Guohua Li for being such a careful research assistant. We are grateful to Sam Henkel (www.samhenkel.com/data) for providing some of the liquidity data used in the paper.

The first country to enact a law against insider trading was the United States, and it was also the first country to enforce an insider trading law (Bhattacharya and Daouk, 2002). Yet, insider trading regulation in the U.S. has avoided definition and rule-making in favor of open-ended standards (Langevoort, 1999), and has evolved with some important U.S. Supreme Court decisions (Bainbridge, 2000). Ironically, the phrase "insider trading" does not even exist in Rule 10b-5 of Section 10(b) of the U.S. Securities Exchange Act of 1934, on which the insider trading law is based. This rule reads: "It shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce, or of mails, or of any facility of any national securities exchange, to employ any device, scheme, or artifice to defraud, to make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or to engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security."

Pakistan, like 80% of emerging markets, has a law prohibiting insider trading, but like 70% of emerging markets who have the insider trading law, did not enforce the law as of the end of 1998 (Bhattacharya and Daouk, 2002). Ironically, the prohibition against insider trading in Pakistan is unambiguous. Part 3(i) in Chapter II of the Listed Companies (Prohibition of Insider Trading) Guidelines reads: "No person who is or has been, at any time during the preceding six months associated with a company shall either on his own behalf or on behalf of any other person, deal in securities of a company listed on a stock exchange on the basis of any unpublished price sensitive information;..."

The purpose of this paper is to argue, both theoretically and empirically, that sometimes no securities law may be better than a good securities law that is not enforced. This is an important issue because a number of emerging markets have adopted securities laws, but many of them have not enforced these laws.[1]

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[1] 25 new Codes of Best Practice for corporate governance were published during the past 5 years. There are currently 39 codes operating in Europe. Most firms, unfortunately, do not comply (*Financial Times*, April 8, 2002). Bhattacharya and Daouk (2002) found that 70% of emerging

There are a couple of reasons why many emerging markets have adopted securities laws, and they are both related. The first reason is that theoretical and empirical results from the law and finance literature – results like the finding that investors provide less capital and demand a higher return if their interests are not protected – have been very influential.[2] The second reason is that transnational institutions like the World Bank, the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), the European Union (EU), and the International Organization of Securities Commissions (IOSCO) are asking or advising their members to adopt securities laws. McGee (2004) points out that the OECD Principles of Corporate Governance, which includes a prohibition against insider trading, have been endorsed by the World Bank, the IMF, and IOSCO. On the other hand, many reasons could explain why the enforcement of securities laws in emerging markets is lacking: lack of political will, poorly funded and incapable regulatory institutions, high burden of proof, or unfriendly courts. Berglof and Claessens (2006) explain how political constraints prevent enforcement in emerging markets.

Given that there are so many countries that have adopted securities laws but have not enforced them, if our thesis about no securities law being sometimes better than a good unenforced securities law is correct, then the implication of this paper is that it is sometimes better not to have a securities law at all than to enact a good securities law that will not or cannot be enforced. In other words, the "cut and paste" approach to securities law promoted by transnational organizations may sometimes be dangerous.[3]

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markets have not enforced their insider trading laws.

[2] Many authors have contributed to this literature, but, according to our view, the most influential have been a series of papers by La Porta, Lopez-de-Silanes, Shleifer and Vishny. Their 1998 paper provides a good overview.

[3] It should be pointed out here that, though we focus in our paper on securities laws and, in particular, insider trading laws, our thesis is applicable to many other capital market laws. For example, the Basle Committee on Banking Supervision laid out the 25 core principles of effective banking supervision in September 1997. National agencies were asked to apply these principles in their jurisdictions. If some national agencies promulgated these rules but did not enforce them, our thesis suggests that the situation in their banking industry may have worsened.

The first part of the paper formalizes the conditions under which no law is better than a good law that is not enforced. Our conditions are general; they apply to any law, not just a securities law. We show that we need two sufficient conditions. The first condition is that the motivation to enact the law is to solve a prisoner's dilemma problem. This means that if there is no law, everyone is stuck in the bad equilibrium; if there is a law and it is enforced, the good equilibrium results. This condition also makes precise what makes a law a good law. The second condition is that there are some agents who will follow the law even if it is not enforced. If these assumptions hold, if a law is enacted but not enforced, only some will follow the law. The ones who do not follow the law will deviate with greater intensity in equilibrium, thereby causing law abiders more harm than they were incurring when there was no law.

The intuition for the first part of the paper is succinctly captured by the following bumper sticker: "When you outlaw guns, the outlaws will win." If there are no gun laws, everyone has guns, and it is the Wild West. Everyone is worse off than in a situation where there are gun laws that are strictly enforced, and no one has guns. However, if there are gun laws that are not enforced, law abiders will not have guns. The outlaws will have more guns because they know that the law abiders do not have guns, and so the law abiders cannot protect themselves and are worse off than they were in a Wild West situation.

The second part of the paper asks whether insider trading laws satisfy the above conditions. Our hunch is that they do, because inside information is like guns in some aspects. It has a negative externality (causes problems, in this case adverse selection problems, for others), but it has a positive internality (it does protect the owner from the adverse actions of others, which in this case is adverse trades.)

Our formal answer is that insider trading sometimes satisfy the above conditions. This happens when corporate insiders have very imperfect information, if the cost of acquiring perfect information is not too high nor too low, and if there are many who will not follow the insider trading law if the insider trading law is not enforced. The intuition for these results is as follows. Whenever there is no insider trading law, all corporate insiders trade, but with imperfect inside information, and so the total adverse selection problem is low. This

is an equilibrium, because as all insiders trade and compete away their rents, each of their insider trading revenues are not high enough to cover the cost of acquiring perfect information, if the cost is bounded below. So they will not acquire perfect information. When there is an insider trading law that is not enforced, only some corporate insiders will trade, but with perfect inside information, and so the total adverse selection problem is high. This is an equilibrium, because as few insiders trade with less competition, each of their insider trading revenues will now cover the cost of acquiring perfect information, if the cost is bounded above. So they will acquire perfect information.

We take our theory to the data in the last part of the paper. We ask whether the cost of equity rises when a country enacts an insider trading law, but does not enforce it. Here we revisit the panel data set assembled by Bhattacharya and Daouk (2002), who showed that enforcement, not the mere existence, of insider trading laws reduced the cost of equity in a country. We follow the Bhattacharya and Daouk (2002) approach in first risk-adjusting country equity returns, and second regressing risk-adjusted country equity returns on insider trading variables and other control variables (like liberalization, liquidity, and foreign exchange risk) to check whether insider trading variables have any effect. We differ from Bhattacharya and Daouk (2002) in one important aspect: we model insider trading law and insider trading enforcement as endogenous, not exogenous, variables. This explicitly addresses reverse causality: changes in the cost of equity may lead to changes in insider trading laws or enforcement, not the other way around.

We find that, indeed, insider trading law and insider trading enforcement are endogenous variables. However, after correcting for this endogeneity, we still find that the cost of equity *actually rises* when an emerging market introduces an insider trading law, but does not enforce it. This effect does not hold for developed countries. As our theoretical model predicted that unenforced insider trading laws may raise the cost of equity *only* when a large number of insiders trade with impunity, and as emerging markets are more likely to have insiders trading with impunity – see Bhattacharya et al. (2000) for the case of Mexico – this is strong evidence in favor of the theoretical model of this paper. So, at least from the point of view of

corporations who raise equity in emerging stock markets, it is better not to have an insider trading law, than to have an insider trading law, but not enforce it. Later on in our paper, instead of using emerging markets/developed markets as a measure of the proportion of people who have respect for the law, we use many other measures like corruption. Our results do not change.

There is also a substantial theoretical literature on enforcement. Shavell (1993) provides a comprehensive framework on the normative aspects of enforcement – when to use outright prevention or ex-post monetary penalties or ex-post non-monetary penalties – and notes that practice is broadly consistent with theory. Polinsky and Shavell (2000) focus on public versus private enforcement, and conclude that public enforcement, not private enforcement, is best when victims do not really know who harmed them. As insider trading is anonymous, this seems to suggest that public enforcement is best for catching insider trading. Public enforcement of insider trading laws is what this paper measures. On the other hand, to protect against fraud in security issuance, where it is clear who the guilty party may be, private enforcement may be better than public enforcement.

There is a also a substantial empirical literature on enforcement. La Porta et al. (2006) find that private enforcement and mandated disclosures benefit markets, whereas public enforcement has little effect. Other researchers have uncovered what enforcement works and what enforcement does not work in areas such as antitrust, criminal law, environment, international law, labor law, patents, property rights, taxes and trade. The general conclusion is that enforcement, especially some kinds of enforcement, work. The lack of enforcement, at worst, is found to have no consequences. Our paper, as far as we know, is the first paper to document that the lack of enforcement sometimes has negative consequences.

The literature on enforcement of capital market laws is starting. We have already cited La Porta et al. (2006) and Berglof and Claessens (2006). Coffee (2007) gives a broad overview. Cox and Thomas (2003) study the complimentarity between SEC enforcement and private litigation. Modigliani and Perotti (2000) document that banks dominate markets in countries with poor enforcement of capital market laws. Hope

(2003) documents that analysts are better in their forecasts in countries with better enforcement of accounting standards. Finally, in debt markets, Djankov et al. (2008) measure the efficiency of debt enforcement in 88 countries.

The literature on enforcement of insider trading laws is sparse. Durnev and Nain (2007) find that insider trading restrictions increase earnings opacity in countries where controlling shareholders can expropriate firm wealth. They interpret this as the unanticipated consequences of insider trading restrictions; controlling shareholders now find other ways to expropriate wealth. Bris (2005) finds that insider trading enforcement increases the incidence and profitability of insider trading, but harsher laws deter illegal insider trading. One of his interpretations is similar to ours: "After prosecution of others, only a few insiders are left, who make more profits than before." Ackerman et al. (2008) find that the enactment of insider trading is more effective in developed counties than in developing countries; Beny (2005) find that the enactment of insider trading laws is more effective in firms with diffuse ownership; Bushman et al. (2005) find that analyst coverage increases after enforcement of insider trading, especially in emerging markets.

Our paper is organized as follows. In section 1, we lay out the two sufficient conditions that ensure that no law is better than a good law that is not enforced. Section 2 tells us when a particular security law – the law prohibiting insider trading – follows these conditions. If so, we show the cost of equity is lower when there is no insider trading law than when there is an insider trading law that is not enforced. The empirical research design is laid out in Section 3. We execute the empirical research design in Section 4 on data. We find that, indeed, the cost of equity rises on an average when an emerging market enacts an insider trading law but does not enforce it. This is not true for developed countries. Section 5 discusses various robustness tests. Section 6 concludes.

1. The General Case

The goal of this section is to formalize the conditions under which no law is better than a good law that is not enforced. We detail below two sufficient conditions for this result.

1.1 THE GOOD LAW IS CREATED TO SOLVE A PRISONER'S DILEMMA SITUATION

There are many motives for enacting a law. One such motive is to solve a prisoner's dilemma situation. We explain what we mean by that by reproducing the payoffs in a simple prisoner's dilemma matrix from a graduate text book in game theory (Fudenberg and Tirole, 1991).

		Agent 1	
		Obey law	Do not obey law
Agent 2	Obey law	U_h , U_h	U_h^+, U_l^-
	Do not obey law	U_l^-, U_h^+	U_l , U_l

If both agents obey the law, they each receive a utility of U_h. This is higher than U_l , the utility they receive when both do not obey the law. However, it is apparent from the payoffs in the above matrix that "both obeying the law" is not a non-cooperative equilibrium. It is in an agent's interest to deviate and break the law if he conjectures that the other agent is obeying the law, because then his utility improves from U_h to U_h^+ . So the only non-cooperative equilibrium that will occur in the above simple one-shot prisoner's dilemma problem is that both break the law, and both are worse off. Such a situation can be prevented if deviations from obeying the law are not allowed or, to put it differently, the law is strictly enforced. In that case, both will obey the law because they have no choice. Both will be better off. This is what makes a law a good law.

To summarize, our first sufficient condition is that the motivation to enact the law should be to solve a prisoner's dilemma problem. This means that if there is no law, everyone is stuck in the bad equilibrium; if there is a good law and it is enforced, the good equilibrium results. We go to our second sufficient condition.

1.2 SOME AGENTS WILL OBEY A LAW EVEN IF IT IS NOT ENFORCED

As the above is a crucial assumption, it needs justification. There are quite a few ways to justify the above assumption. One way is to appeal to individual morals. Some people will never break the law, whereas some people will break the law when it is in their interest to do so. These attitudes are hard-wired into their utility functions. A second way is to appeal to different non-pecuniary costs of being caught breaking the law. Such non-pecuniary costs may be interpreted as the social sanction against breaking a law. Some people live in a social circle where the social sanctions against breaking a law are high, and so they never break the law, whereas some people live in a social circle where the social sanctions against breaking a law are low, and so they break the law when it is in their interest to do so.[4] A third way is to appeal to different risk-aversion parameters. If there exists pecuniary penalties for breaking the law, but enforcement of the law is probabilistic, some people will not break the law if they are very risk-averse, whereas the not so risk-averse will break the law if it is in their interest to do so.

Assume that agent 1 will obey a law even if it is not enforced, whereas agent 2 will obey a non-enforced law only if it is in his interest to do so. Now let us analyze a situation where a law is enacted, but it is not enforced. In this situation, agent 1 will obey the law by assumption. Agent 2 will break the law because his utility improves from U_h to U_h^+ if he deviates from obeying the law to breaking the law. Therefore, the equilibrium that will result is that agent 1 obeys the law whereas agent 2 breaks the law. The utilities of agents 1 and 2 in this equilibrium are U_l^- and U_h^+ respectively. Notice that the utility of agent 1 in this case is U_l^-, which is lower than U_l, his utility in the case where no one was obeying the law. So agent 1 is better under a lawless situation than he is under a situation where there is an unenforced good law.

To summarize, if both these assumptions hold, then if a law is enacted but not enforced, only some will follow the law. The ones who do not follow the law will deviate with greater intensity, thereby causing law abiders more harm than they were incurring when there was no law.

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[4] We are indebted to Kazu Ohashi for this suggestion. These social costs and benefits are not included in the above simple prisoner's dilemma matrix.

A deeper analysis of the above prisoner's dilemma matrix leads to the following insight. The seemingly counter-intuitive result of our paper – sometimes no law is better than a good law – does not work for all types of laws. It only works for laws that are designed to prohibit an action whose negative externality (the action hurts other agents) is higher than its positive internality (the action protects the agent). It is for this reason that everyone is worse off when no one obeys the law, and everyone is better off when everyone obeys the law. It is also for this reason that the agent who obeys a law that is not enforced is worse off than in a situation where there are no laws. In the former case, he suffers the negative externality imposed on him by the agent who is not obeying the law, whereas in the latter case, this negative externality is somewhat ameliorated by the positive internality. In short, no law is better than a good law if (1) the law is designed to prohibit actions whose negative externality is higher than its positive internality, and (2) there exist some agents who will not obey the law if it is not enforced.

So our result will apply to securities laws like insider trading, where there is a negative externality and a positive internality, but will not apply to laws against pollution, where there is a negative externality but no positive internality.

2. A Specific Case – Insider Trading Regulations

We have demonstrated in the previous section that sometimes law abiders are better off when there is no law than when there is an unenforced good law. We have not demonstrated whether society as a whole is better off when there is no law than when there are unenforced good laws. For us to demonstrate that, we need to put weights on how much society values both types of agents as well as consider the costs of enforcement. Instead of doing that, in this section, we analyze the case of insider trading, where there exists a clear metric to measure whether corporations are better or worse off when there is no law against insider trading than when there is an unenforced law against insider trading – the metric of the cost of equity (the return shareholders expect for holding equity in corporations.)

2.1 MODEL

Assets

There are a large number of identical firms in the economy. Their value is normalized to zero. Firms raise money for new investments by selling equity to outside shareholders. These new investments are risky. The terminal payoff of each share in this new investment is equally likely to be +1 or -1. The utility of firms is U_C ,which is the price that they can sell their equity to outside shareholders. They want this to be as high as possible.

Agents

There are a continuum of infinitesimal corporate insiders belonging to the above corporations. The total mass of these corporate insiders is γ. Corporate insiders, by virtue of their position within the corporation have inside information about the future payoffs of new corporate investments, but their inside information is not perfect.

Imperfect inside information is modeled as follows. Corporate insiders get a signal, which could be a good signal or a bad signal. The probability of getting a good signal if the terminal payoff is +1 is q, which is also the probability of getting a bad signal if the terminal payoff is -1. $q > 0.5$. Corporate insiders, however, can make their signal perfect (i.e., make $q=1$) by expending a personal cost, c.

Corporate insiders are risk-neutral. They obtain their utility from net profits made from insider trading. The objective of a mass $(1-f)\gamma$ of corporate insiders is to maximize their utility, subject to the constraint that they will not do any thing illegal. The objective of the rest of the corporate insiders, who are of mass $f\gamma$, is to maximize their utility without any such constraints. Corporate insiders get to choose whether to acquire perfect inside information.

There are a continuum of infinitesimal noise traders, whose total mass is 1. They trade because of liquidity reasons, and they are equally likely to buy or sell. The logic for making this assumption of noise traders is standard: without noise traders, the insiders' trade would fully reveal their private information, and

thus there would be no incentive to collect costly information to trade (Grossman and Stiglitz (1980).)

There is a risk-neutral market maker who commits himself to offer a liquidity supply schedule. The details of this market are inspired by the extensive form introduced in Glosten and Milgrom (1985.)[5] The market maker commits himself to offer share prices that are conditioned on his observation of order flows. He allows only two order flows: a specific quantity of buy orders and a specific quantity of sell orders. We exogenously restrict the size of the order flows, as did Glosten-Milgrom (1985), to prevent infinite orders from risk-neutral traders. As market making is a competitive business, share prices are set such that the market maker's conditional expected profit in this competitive market is zero. In other words, the share price equals the conditional expected value of the firm, a conditioning that is done with respect to the market maker's information set. The market maker's information set is his observation of order flow.

Timing

At t=0, corporate insiders are endowed with imperfect information about the future payoff of a new corporate investment. At a personal cost, c, they may choose to make this information perfect. A Glosten-Milgrom market maker offers an ask price A (a bid price B) if a trader wants to buy shares from (sell shares to) the market maker. At t=1, trade with the market maker takes place at the posted prices. The trader could be a noise trader or a corporate insider. At t=2, the firm raises money by selling equity. At t=3, the payoff of the risky assets are realized. All portfolios are consumed, and utilities are realized.

2.2 ANALYSIS OF THE MODEL

Insider Trading Laws Exist and Are Enforced

When insider trading laws exist and are strictly enforced, corporate insiders abstain from trading. This means that order flows contain no information. In this case, the market maker's expectation of the firm's value will not be conditional on order flows. As firm value is +1 half the time and -1 half the time, the market

[5] The Kyle (1985) model gives the same results in our binary framework. Krishnan (1992) uses a binary framework to show the equivalence between Glosten-Milgrom (1985) and Kyle (1985), given identical parametric assumptions.

maker's expected value is zero. It will be zero whether order flows are positive or negative. So ask price equals bid price which equals zero.

The utility of the corporations, U_C , because the selling price of their equity is the bid price, is, therefore, zero as well.

Insider Trading Laws Do Not Exist

We will assume that the market maker conjectures that every corporate insider will do insider trading by giving a buy order of one share or a sell order of one share, but none will obtain perfect private information. Later on, we will show that these conjectures will be upheld in equilibrium if certain restrictions on exogenous parameters are upheld. Given these conjectures, the proportion of traders who are insiders are $\gamma/(1+\gamma)$.

We will now follow the logic used by Glosten-Milgrom (1985) to determine the ask price. The ask price is the price that the market maker offers when a trader wants to buy one share. This equals, as we have mentioned before, the expected value of a share conditional on the order flow being a buy order. A buy order could come from a noise trader with probability $1 - \{\gamma/(1+\gamma)\}$. A noise trader has no inside information, and so the market maker's expected value of the firm remains at 0 if the trader is a noise trader. A buy order could come from a corporate insider with probability $\{\gamma/(1+\gamma)\}$. This corporate insider has imperfect information. His signal has to be good for him to be giving a buy order. The expected value of the firm conditional on it being a noisy good signal is 2q-1. So the ask price is $\{0\}\{1-\gamma/(1+\gamma)\} + \{2q-1\}\{\gamma/(1+\gamma)\} = \{2q-1\}\{\gamma/(1+\gamma)\}$. By symmetry, the bid price is $- \{2q-1\}\{\gamma/(1+\gamma)\}$.

The utility of the corporations, U_C , as the selling price of their equity is the bid price, is, therefore, $- \{2q-1\}\{\gamma/(1+\gamma)\}$.

Notice that U_C, when no one was trading with inside information was zero, but U_C, when everyone is trading with inside information is negative. The reason for this is that when insiders are allowed to trade, corporations wishing to sell their equity to the public have to compensate shareholders for the adverse

selection problem by pricing the equity at a low price or, alternatively, give shareholders a higher return.

Finally, to prove that this indeed is an equilibrium, we need to show that the conjecture of the market maker – all corporate insiders trade and none collect perfect private information – is upheld. The first is easy to show. Given a quoted bid and ask price, a person with an endowment of inside information will prefer trading on that information than not trading on that information because insider trading is profitable. To show the second, we need a restriction on an exogenous parameter. To be specific, we need to show that the cost of collecting perfect information is bounded below; otherwise the corporate insiders will always collect perfect private information. So the following inequality has to be satisfied: the profit from imperfect information – $[\{2q-1\}\{1-\gamma/(1+\gamma)\}]$ – should be higher than the profit from perfect information minus the cost of obtaining the perfect information – $[1-\gamma(2q-1)/(1+\gamma)\}] - c$. In other words, $c > 2(1-q)$.

To summarize this section, we have shown a situation where corporations are worse off when all corporate insiders trade (there is no insider trading law) than when none of them trade (there is an insider trading law and it is enforced.)

Insider Trading Laws Exist, But Are Not Enforced

We will assume that the market maker conjectures that some corporate insiders will not do insider trading, but the ones who do will obtain perfect private information. These insiders will buy two shares or sell two shares. Later on, we will show that these conjectures will be upheld in equilibrium if certain restrictions on exogenous parameters are upheld. Given these conjectures, the proportion of traders who are insiders are $f\gamma/(1+f\gamma)$.

The determination of bid and ask prices follows the same logic as in the previous section. As a matter of fact, there are only two differences. First, the proportion of insiders was $\gamma/(1+\gamma)$ before, but now it is $f\gamma/(1+f\gamma)$. Second, the quality of inside information of the corporate insiders who trade was imperfect before ($0.5 < q < 1$), but now it is perfect ($q=1$).

A buy order could come from a noise trader with probability $1 - f\gamma/(1+f\gamma)$. A noise trader has no

inside information, and so the market maker's expected value of the firm remains at 0 if the trader is a noise trader. A buy order could come from a corporate insider with probability $f\gamma/(1+f\gamma)$. This corporate insider now has perfect information. His signal has to be good for him to be giving a buy order. The expected value of the firm conditional on it being a perfect good signal is 1. So the ask price is $\{0\}\{1-f\gamma/(1+f\gamma)\} + \{1\}\{f\gamma/(1+f\gamma)\} = \{f\gamma/(1+f\gamma)\}$. By symmetry, the bid price is $-\{f\gamma/(1+f\gamma)\}$.

The utility of the corporations, U_C, because the selling price of their equity is the bid price, is now $-f\gamma/(1+f\gamma)$.

Finally, to prove that this indeed is an equilibrium, we need to show that the conjecture of the market maker – only some corporate insiders trade, and they trade with perfect private information – is upheld. The first is easy to show. By assumption, some corporate insiders do not trade. The corporate insiders who can trade do so, because, like before, insider trading is always profitable. To show the second, we need to show that the cost of collecting perfect information is bounded above; otherwise the corporate insiders who can trade will never collect perfect private information. So the following inequality has to be satisfied: the profit from perfect information minus the cost of obtaining the perfect information $– 2[\{1- f\gamma/(1+f\gamma)\}] - c$ – should be higher than the profit from imperfect information $– 2[\{2q-1\}- f\gamma/(1+f\gamma)\}]$. In other words, $c < 4(1-q)$.

When No Insider Trading Law is Better than an Unenforced Insider Trading Law

We answer this from the point of view of the corporation. Corporations get a lower price for their equity or, alternately, have to pay a higher return to their shareholders if U_C in the case where insider trading laws existed but were not enforced is lower than the case where insider trading laws did not exist.

Formally, given the arguments above, the condition is

$$\{1\}\{f\gamma/(1+f\gamma)\} > \{2q-1\}\{\gamma/(1+\gamma)\} \quad (1)$$

Further, given the arguments above, the cost of obtaining perfect information should be bounded above and below. As we had shown earlier, this means that

$$4(1-q) > c > 2(1-q) \quad (2)$$

Notice that inequality (1) formalizes the intuition we derived from the prisoner's dilemma problem. There we had seen that the counter-intuitive result of this paper – no law may be better than an unenforced good law – only holds for laws which prohibit actions whose negative externality is higher than their positive internality. This means, in the context of insider trading, is that our result will only work if the *net* adverse selection of insider trading is lower under no insider trading law than under an unenforced insider trading law. To be more specific, if there is no insider trading law, all corporate insiders trade – measured by the greater proportion of insiders, $\gamma/(1+\gamma)$ – but they trade with imperfect inside information – measured by $(2q-1)$ – and so the total net adverse selection problem – the product of the two, which is the RHS of (1) – is low. On the other hand, if there is an insider trading law that is not enforced, only some corporate insiders will trade – measured by the smaller proportion of insiders, $f\gamma/(1+f\gamma)$ – but they will trade with perfect inside information – measured by 1 – and so the total net adverse selection problem – the product of the two, which is the LHS of (1) – is high. Inequality (1) is satisfied if q is small (corporate insiders have very imperfect information) and/or f is large (there are many who will not follow the insider trading law if the insider trading law is not enforced.) Inequality (2) implies that the cost of acquiring perfect information is not too high nor too low.

To summarize, no insider trading law is better than an unenforced insider trading law if the negative externality of adverse selection is lower under no insider trading law than under an unenforced insider trading law. This happens when corporate insiders have very imperfect information, if the cost of acquiring perfect information is not too high nor too low, and if there are many who will not follow the insider trading law if the insider trading law is not enforced. The intuition for these results is as follows. Whenever there is no insider trading law, all corporate insiders will trade. However, as their information is very imperfect, the adverse selection problem will be low. Moreover, as all insiders trade and compete away their rents, their insider trading revenues are low, and this does not cover the cost of acquiring perfect information if the cost is bounded below. So they will not acquire perfect information. When there is an insider trading law but not

enforced, some corporate insiders will not trade. The revenues of the ones who do trade will rise, and this will cover the cost of acquiring perfect information if the cost is bounded above. So they will acquire perfect information. This, plus the fact that many of them are trading with perfect inside information, increases the adverse selection problem.

Given data limitations, we will focus on one testable implication of our theoretical model: no insider trading law is better than an unenforced insider trading law, i.e. cost of equity under no insider trading law is lower than cost of equity under an unenforced insider trading law for one special circumstance. This special circumstance occurs if there are many agents in an economy who will not follow the insider trading law if the insider trading law is not enforced.

The next section develops the empirical research design, with particular emphasis on how we measure insider trading, cost of equity, and the number of agents who follow laws only when they are enforced.

3. Empirical Research Design

3.1 INSIDER TRADING MEASURES

Bhattacharya and Daouk (2002) found that there were 103 countries that had stock markets at the end of 1998, of which 22 were classified as developed markets, and 81 were classified as emerging markets. They found out from each of the 103 stock markets whether these markets had insider trading laws and, if yes, from when, and whether and when anyone had been prosecuted under these laws, successfully or otherwise.

We use the above two dates from Bhattacharya and Daouk (2002). These two dates, the year an insider trading law was first enacted and the year there was the first prosecution under these laws, are given in columns two and three in Table I. Our measure of insider trading law takes on a value 0 till the year the law comes into existence, and takes on the value 1 in the years after that. Our measure of insider trading enforcement takes on a value 0 till the year the law comes into existence, takes on a value e^{-t} in the t^{th} year after the law is enacted but not enforced, and takes on the value 1 in the years after the first enforcement. The idea behind this enforcement measure is that there is no enforcement unless there is a law. Once a law is

passed, it is expected to be enforced, but this expectation declines with the passage of time if there is no enforcement. If an enforcement occurs, the expectation is revived.[6]

Our measure of enforcement – the first prosecution of an insider trading case – has the following limitations. First, we assume that if there is no first case of insider trading prosecution in a country, there is no enforcement of insider trading law in a country. This is a severe assumption because, in practice, enforcement may exist even if no cases are brought to bear. There could be out of court settlements, or monitoring may be so strict that no one does insider trading, and so no cases are brought. Unfortunately, we do not have data on out of court settlements, or data on the strictness of monitoring. Second, we ignore successive prosecutions. This is because, except for one country, we do not have this data. However, Bhattacharya and Daouk (2002) showed that the first prosecution is immensely important; it is almost tantamount to a regulatory regime change. Third, not having this data, we ignore other ex-post penalties like suspensions, fines, disciplinary measures. Since more developed markets are likely to have more such regulatory tools, this leads us to believe that enforcement is higher in developed markets. However, this fact should not bias our results. If developing countries are expected to have little enforcement, there is no reason to believe that lack of enforcement hurts them the *most*. Fourth, and most important, our measure is an ex-post measure of enforcement. Ex-post measures of enforcement suffer from the following paradox. If the threat of enforcement is severe and credible ex-ante, there will be no infractions and, hence, no ex-post prosecutions. We, unlike Jackson and Roe (2008), do not have access to ex-ante measures of credible enforcement threats like budgets and staffing. However, it should be noted that these ex-ante measures of enforcement suffer from their own paradox: big budgets and large staff may not be credible threats, and could be there just for show. An ex-post binary measure like prosecution/no prosecution has the further advantage that we do not have to worry much about who does the prosecution.

[6] This definition of insider trading enforcement is more sophisticated than the one used by Bhattacharya and Daouk (2002), who had used a simple step function: the enforcement variable is 0 till the first enforcement, and 1 after that. We reran all our tests using their definition. Our qualitative results do not change.

An important implication of our theoretical model is that no insider trading law is better than an unenforced insider trading law *only* if the number of insiders trading with impunity is large. We do not know how many insiders trade with impunity in a market. We know, however, that emerging markets are more likely to have insiders trading with impunity – see Bhattacharya et al. (2000) for the case of Mexico. We, therefore, interact our insider trading law and enforcement measures with a dummy variable that is 1 if it is an emerging market and 0 otherwise. If the prediction of the theoretical model holds, we should observe that the cost of trading should especially rise for emerging markets if there is an unenforced insider trading law.

3.2 COST OF EQUITY MEASURES

The cost of equity in a country is defined as the return shareholders require for holding shares in that country. Classical finance theory tells us that the major determinant of the cost of equity is the risk of equity. So the first thing we do is to remove the effect of risk.

We employ the approach used by Bhattacharya and Daouk (2002) to remove the effect of risk. They adopt a simplified version of an international asset pricing model first used by Bekaert and Harvey (1995). This empirical model allows for partial integration of a country to the world equity markets. The model is very 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 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. This international asset pricing model is expressed as follows:

$$\left(r_{i,t} - r_{f,t}\right) = \alpha_0 + \phi_{i,t}\lambda_{\text{cov}}h_{i,w,t} + \left(1 - \phi_{i,t}\right)\lambda_{\text{var}}h_{i,t} + e_{i,t} \qquad (3)$$

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,

$\varphi_{i,t}$ is a measure of the level of integration of country i at time t, $0 \le \varphi_{i,t} \le 1$, and this is defined later,

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, and this is defined later,

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 this is defined later, and

$e_{i,t}$ is the residual error term, which is the cost of equity after the effect of risk has been removed.

The independent variables in model (3) – 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.

$$
\begin{aligned}
r_{i,t} &= c_1 + \varepsilon_{i,t}, \\
r_{w,t} &= c_2 + \varepsilon_{w,t}, \\
h_{i,t} &= b_1 + a_1\left(\tfrac{1}{2}\varepsilon^2_{i,t-1} + \tfrac{1}{3}\varepsilon^2_{i,t-2} + \tfrac{1}{6}\varepsilon^2_{i,t-3}\right), \\
h_{w,t} &= b_2 + a_2\left(\tfrac{1}{2}\varepsilon^2_{w,t-1} + \tfrac{1}{3}\varepsilon^2_{w,t-2} + \tfrac{1}{6}\varepsilon^2_{w,t-3}\right), \\
h_{i,w,t} &= b_3 + a_3\left(\tfrac{1}{2}\varepsilon_{i,t-1}\varepsilon_{w,t-1} + \tfrac{1}{3}\varepsilon_{i,t-2}\varepsilon_{w,t-2} + \tfrac{1}{6}\varepsilon_{i,t-3}\varepsilon_{w,t-3}\right), \\
\varepsilon_{i,t}, \varepsilon_{w,t} &\sim N\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix} h_{i,t} & h_{i,w,t} \\ h_{i,w,t} & h_{w,t}\end{bmatrix}\right).
\end{aligned}
\tag{4}
$$

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 ε {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 ε{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.

The parameters a_1, b_1, c_1, a_3, and b_3 in Model (4) are country-specific. The constants a_2, b_2, and c_2 in Model (4) are constrained to be identical for all country-world pairs. Model (4) was first introduced by Bollerslev et al. (1988). As in Engle et al. (1987), the weights of the lagged residual vectors are taken to be 1/2, 1/3, and 1/6, respectively. Maximum likelihood is used to estimate model (4).

The other independent variable in model (3) – $\varphi_{i,t}$ – measures the level of integration of country i at time t. It is defined, as in Bhattacharya and Daouk (2002), to be:

$$\phi_{i,t} = \frac{\exp\left(\alpha_1\left(\frac{\exp orts_{i,t} + imports_{i,t}}{gdp_{i,t}}\right)\right)}{1 + \exp\left(\alpha_1\left(\frac{\exp orts_{i,t} + imports_{i,t}}{gdp_{i,t}}\right)\right)} \qquad (5)$$

The above definition of $\varphi_{i,t}$ in Equation (5) 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 associated with increased importance of the world factor relative to local risk factors.

Data on monthly equity indices of 22 developed countries were obtained from Morgan Stanley Capital International (MSCI). Data on monthly equity indices of 33 emerging markets were obtained from International Financial Corporation (IFC). The first column in Table 1 gives the names of these countries as well as the sample period that was available for these 55 monthly stock market indices in the 1969-1998 period. These indices are value-weighted, and are calculated with dividend reinvestment. As noted by

Harvey (1991), the returns computed on the basis of these indices are highly correlated with popular country indices. The MSCI value-weighted World Index was used as a proxy for the world market portfolio. Finally, monthly data on exports and imports for the 55 countries were obtained from the International Financial Statistics provided by the International Monetary Fund. Data on GDP for the 55 countries were also obtained from the International Financial Statistics provided by the International Monetary Fund. For some countries the frequency of GDP was quarterly, and for some it was yearly. To obtain monthly GDP, we divided by 3 in the former case, and by 12 in the latter case.

We computed monthly returns of each country's stock market from their indices, the monthly return of the global portfolio from the MSCI value-weighted world index, and φ, the integration measure of each country per month from its exports, imports and GDP, using the formula given in Equation (5). The seventh and eighth columns in Table I gives the mean monthly return and the standard deviation of monthly returns per country in the 1969-1998 sample period (some countries do not have data for the full period.)

We then used the monthly returns of each country, the monthly return of the global portfolio, and the monthly integration measure of each country in Equations (3), (4) and (5) to obtain $e_{i,t}$, which is the cost of equity after the effect of risk has been removed.[7]

3.3 LINK BETWEEN INSIDER TRADING AND THE COST OF EQUITY

Insider trading and cost of equity are both endogenous variables. It is possible that changes in institutional factors within a country intended to facilitate capital formation simultaneously impact the likelihood of enacting and enforcing an insider trading law as well as the cost of equity. As an example, a substantial commitment of government resources to improve law and order could result in the enactment and enforcement of insider trading laws as well as lower cost of equity due to better enforcement of property rights. In such circumstances, a simple regression would reveal a spurious association between insider trading

[7] Bhattacharya and Daouk (2002) used a two-step procedure (first remove the effect of risk, and then test the effect of other independent variables on the residuals) instead of using a one-step procedure (include all independent variables in model (3) directly) because of technical convergence problems in the one-step non-linear estimation procedure.

and the cost of equity, as all are impacted by a third variable. This limits our ability to draw clear causal inferences from simple regressions.

The above is a valid criticism. To mitigate this criticism, the tests in this paper are panel Vector Auto Regressions (panel VARs). These panel VARs are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation. These panel data tests with fixed country effects minimize the endogeneity problem. As a matter of fact, if the unobserved source of endogeneity is constant over time, panel data with country fixed effects effectively eliminates the potential bias caused by endogeneity. However, it is possible that the missing country-specific variables or the institutional features creating simultaneity between insider trading laws and cost of equity may change over the period of our analysis. We address this issue directly by explicitly modeling insider trading laws and the cost of equity as endogenously determined dependent variables at each point in time. That is the reason we use a panel VAR test instead of simple panel tests in this paper. This contrasts with Bhattacharya and Daouk (2002), who do not have this correction for endogeneity, and, therefore, use simple panel data tests.

The 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 some of the independent variables. The system of equations to estimate the effect of insider trading on the cost of equity is formally modeled as

$$e_{i,t} = \beta_{10} + \beta_{11}\, Foreign\ Exchange\ Risk_{i,t} + \beta_{12}\, Liquidity_{i,t} + \beta_{13}\, Liberalization_{i,t} + \beta_{14}\, Insider\ Trading\ Law_{i,t-1} + \beta_{15}\, Insider\ Trading\ Enforcement_{i,t-1} + \beta_{16}\, Insider\ Trading\ Law_{i,t-1} * Emerging\ Market\ Dummy + \beta_{17}\, Insider\ Trading\ Enforcement_{i,t-1} * Emerging\ Market\ Dummy + u_{1i,t}$$

and

$$Insider\ Trading\ Law_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}\, Corruption_{i,t} + \beta_{23}\, Law\ and\ Order_{i,t} + \beta_{24}\, Bureaucracy\ Quality_{i,t} + u_{2i,t}$$

and

$$\textit{Insider Trading Enforcement}_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}\, \textit{Corruption}_{i,t} + \beta_{33}\, \textit{Law and Order}_{i,t} + \beta_{34}\, \textit{Bureaucracy Quality}_{i,t} + u_{3i,t} \quad (6)$$

where

$e_{i,t}$ is the monthly residual error term from Equation (3), which is the risk-adjusted cost of equity;

$\textit{Foreign Exchange Risk}_{i,t}$ is 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, is denoted as $h_{i,ifx,\,t}$, and is estimated every month from the multivariate ARCH model given below

$$\begin{aligned}
r_{i,t} &= f_1 + \varepsilon_{i,t}, \\
r_{ifx,t} &= f_2 + \varepsilon_{ifx,t}, \\
h_{i,t} &= e_1 + d_1\left(\tfrac{1}{2}\varepsilon_{i,t-1}^2 + \tfrac{1}{3}\varepsilon_{i,t-2}^2 + \tfrac{1}{6}\varepsilon_{i,t-3}^2\right), \\
h_{ifx,t} &= e_2 + d_2\left(\tfrac{1}{2}\varepsilon_{ifx,t-1}^2 + \tfrac{1}{3}\varepsilon_{ifx,t-2}^2 + \tfrac{1}{6}\varepsilon_{ifx,t-3}^2\right), \\
h_{i,ifx,t} &= e_3 + d_3\left(\tfrac{1}{2}\varepsilon_{i,t-1}\varepsilon_{ifx,t-1} + \tfrac{1}{3}\varepsilon_{i,t-2}\varepsilon_{ifx,t-2} + \tfrac{1}{6}\varepsilon_{i,t-3}\varepsilon_{ifx,t-3}\right), \\
\varepsilon_{i,t}, \varepsilon_{ifx,t} &\sim \mathrm{N}\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix} h_{i,t} & h_{i,ifx,t} \\ h_{i,ifx,t} & h_{ifx,t}\end{bmatrix}\right).
\end{aligned} \quad (7),$$

where

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

$\varepsilon_{ifx,\,t-j}$ is the innovation in monthly depreciation of the i^{th} foreign currency with respect to the dollar at time t-j, j ε {0,1,2,3};

$\textit{Liquidity}_{i,t}$ is the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month;

$\textit{Liberalization}_{i,t}$ in country i is 1 for t=P+1,P+2,...and is 0 for the other months, where P is the official

liberalization month;

Insider Trading Law$_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted;

Insider Trading Enforcement$_{i,t}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution;

Emerging Market Dummy is equal to 1 if country is an emerging market, and 0 otherwise;

Corruption$_{i,t}$ is a monthly measure of corruption within the political system in country i;

Law and Order$_{i,t}$ is the sum of two monthly sub-components in country i; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; and

Bureaucracy Quality$_{i,t}$ is a monthly measure in country i of the institutional strength and quality of the bureaucracy.

The parameters d_1, d_2, e_1, e_2, f_1, f_2, d_3, and e_3 in Model (7) are country-specific.

The first equation in the system of equations (6) is the most important equation. It checks whether the risk-adjusted cost of equity in a country is affected by certain variables of interest. The variables of interest in this paper are the existence of an insider trading law and the existence of enforcement of the insider trading law. The coefficient on the insider trading law variable (coefficient on the insider trading law variable plus the coefficient on the interaction of the insider trading law variable and the emerging market dummy) is the effect of an insider trading law that is not enforced in a developed country (emerging market). The sum of the coefficients on the insider trading law variable (coefficient on the insider trading law variable plus the coefficient on the interaction of the insider trading law variable and the emerging market dummy) and the insider trading enforcement variable (coefficient on the insider trading enforcement variable plus the coefficient on the interaction of the insider trading

enforcement variable and the emerging market dummy) is the effect of an insider trading law that is enforced in a developed country (emerging market). As there is no enforcement without having a law, the coefficient on the insider trading enforcement variables have no interpretation.[8]

Control variables used in the first equation are foreign exchange risk, liquidity, and liberalization. If purchasing power parity holds, foreign exchange risk should not affect the cost of equity. However, 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. 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. From this we compute the monthly depreciation or appreciation of the i^{th} foreign currency with respect to the US dollar, and then use Equation (7) to estimate the monthly foreign exchange risk of country i. This is the conditional covariance of the return of the stock market index of country i with the depreciation of the i^{th} foreign currency with respect to the dollar at time t; it is denoted as $h_{i,ifx,\,t}$ in Equation (7).

Liquidity, as demonstrated by Amihud and Mendelson (1986), and Brennan and Subrahmanyam (1996), may also affect the cost of equity. We include this control in our international asset pricing factor model as well. The measure of liquidity that we adopted was the natural log of turnover, where turnover is defined as the volume of trade in the stock market divided by the market capitalization of the stock market. We could obtain monthly data on the volume of trade and market capitalization for 35 of the 55

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[8] Panel B1 in Table III of Bhattacharya and Daouk (2002) is their punch-line. It tells us that it is insider trading enforcement, not the mere enactment of an insider trading law, that reduces the cost of equity in a country. This panel, though not the explanation in the text, is slightly misleading. It gives the impression that the tests were run with both the insider trading law variable and the insider trading enforcement variable in the LHS of the estimation equation, as in Equation (6) above. That is not what they did. The text in Bhattacharya and Daouk (2002) tells us that the tests were run with these variables *one at a time*; Panel B1 in Table III of Bhattacharya and Daouk (2002) gives the results from these one-at-a-time tests. The tests on this paper, however, have both variables together. This is seen in Equation (6) above. That is why the coefficient of the insider trading law variable in Equation (6) is interpreted as the effect of an unenforced insider trading law.

countries from the vendor Datastream. The ninth column in Table I gives us the time period for which liquidity is computed for these 35 countries.

When a country opens up its capital markets to foreigners, the cost of equity is reduced through two routes (Stulz, 1999.) It reduces required return because risk-sharing improves, and it reduces required return because corporate governance improves. Bekaert and Harvey (2000) and Henry (2000) empirically confirm that such liberalization reduces the cost of equity. We include this control in our international asset pricing factor model as well. Our liberalization variable is 0 till the month a country liberalizes, and it becomes 1 after that. We obtain official liberalization dates from Table I in Bekaert and Harvey (2000). These dates are given in column ten in Table I.

The second equation in the system of equations (6) explicitly recognizes that the enactment of an insider trading law may be an endogenous variable. A country may enact an insider trading law when the cost of equity in its stock market has risen. This is to make its stock market more attractive. This implies that a positive correlation between insider trading law and the cost of equity is actually because an increase in the cost of equity is causing an enactment of an insider trading law, and not because the enactment of the insider trading law (which has not been enforced) is causing an increase in the cost of equity. This confusion between cause and effect has to be sorted out, and that is what the second equation in the system of equations (6) does. The second equation also recognizes that insider trading laws may be enacted in a country when the general quality of its legal and bureaucratic institutions change. We use three measures of the quality of institutions in a country: corruption, law and order, and bureaucracy quality. These three metrics are obtained from the International Country Risk Guide (ICRG) of the PRS group. Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0

(lowest) to 3 (highest). Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). We obtain these three monthly time series from January 1984 through December 1998. The mean value of these three time series of corruption, law and order and bureaucracy quality, is given in columns four through six in Table I respectively.

The third equation in the system of equations (6) explicitly recognizes that, like the enactment of an insider trading law, the enforcement of an insider trading law also may be an endogenous variable. A country may enforce an insider trading law when its cost of equity changes and/or the general quality of its legal and bureaucratic institutions change. We use the same four control variables we used for the insider trading law case – past risk-adjusted cost of equity and the three measures of the quality of institutions in a country (corruption, law and order, and bureaucracy quality.)

The system of equations (6) is estimated jointly using Seemingly Unrelated Regressions (SUR.) SUR computes estimates using the technique of joint GLS (Generalized Least Squares). The three error terms $u_{1i,t}$, $u_{2i,t}$ and $u_{3i,t}$ 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.

4. Empirical Evidence

The results of the estimation of Equation (3) are given in Panel A of Table II, whereas the results of the joint estimation of the system of equations (6) are given in Panels B, C and D of Table II.

Panel A of Table II tells us whether risk is priced in global equity markets. Panel A reveals that country covariance risk seems to have a positive price (λ_{cov} is positive) and is statistically significant at the five percent level. This suggests that a country beta is priced. Panel A in Table II also tells us that even country variance risk has a positive price(λ_{var} is positive), though the estimate is significant only at the six percent level. This suggests that many equity markets in the world are quite segmented, and their returns are driven by their own variances. The above results are the same as in Bhattacharya and Daouk (2002).

This should not be surprising, as we use the same data set and the same estimation procedure.

Panel B of Table II checks whether the risk-adjusted equity return of a country – the residuals from the estimation of Equation (3) – are influenced by the existence and enforcement of insider trading laws in the country after we control for foreign exchange risk, liberalization, and liquidity. Panel B of Table II, therefore, gives the main empirical results of the paper. We notice that the coefficient on the lagged insider trading law variable is positive but not significant, suggesting that when an insider trading law is instituted in a developed country but not enforced, the cost of equity in that developed country *is not significantly affected*. More interestingly, notice that the coefficient on the interaction term between the lagged insider trading law variable and the emerging market dummy is positive and significant. This suggests that when an insider trading law is instituted in an emerging market but not enforced, the cost of equity in that country *actually rises*. The above two results are strong evidence in favor of our theoretical model, whose testable implication was that unenforced insider trading laws raise the cost of equity only when there are a large number of insiders trading with impunity (which is a likely occurrence in emerging markets.) Notice also that the sum of the coefficients on the lagged insider trading law variable and the lagged insider trading enforcement variable is negative for both developed and emerging markets, suggesting that when an insider trading law is enforced in a country, the cost of equity in that country falls. This is the same result that Bhattacharya and Daouk (2002) obtained.

The enactment of insider trading laws and the enforcement of insider trading laws could also be endogenous, and therefore the interpretation of the correlation coefficients between these two variables and the cost of equity, which is another endogenous variable, should be done with caution. We take extreme caution by explicitly modeling the enactment of insider trading laws and the enforcement of insider trading laws as endogenous. Panel C in Table II tests whether the enactment of insider trading laws in a country are influenced by the past risk-adjusted cost of equity in a country, after we control for corruption, law and order, and the quality of bureaucracy. Panel D in Table II tests whether the

enforcement of insider trading laws in a country are influenced by the past risk-adjusted cost of equity in a country, after we control for corruption, law and order, and the quality of bureaucracy. The results of Panels C and D in Table II are broadly similar, and quite intuitive. They tell us, as suspected, that the enactment of insider trading laws and the enforcement of insider trading laws are endogenous variables. Insider trading laws are likely to be enacted and are likely to be enforced if the law and order situation improves and/or the quality of the bureaucracy improves. Interestingly, insider trading laws are likely to be enacted and are likely to be enforced if corruption increases, which means that these could be responses to increased corruption. Past risk-adjusted cost of equity seems to have no effect on the enactment of insider trading laws, though it seems to have a negative effect on the enforcement of insider trading laws.

It should be noted that though the enactment and enforcement of insider trading laws are endogenous, since we estimate Panels B, C and D in Table II jointly, the effect of the independent variables on each endogenous variable takes into account the endogenous nature of some of the independent variables. Our interpretations of the coefficients in Panel B of Table II – our main results – are, therefore, legitimate.

A potential issue with our data is that the first enforcement of insider trading laws seems to be clustered in the late 1990s. We addressed this concern by redoing our analysis by including year fixed effects. The results do not change.

5. Some Robustness Tests

The main test that we use in this paper is complex. We now run two simpler tests. The first is a very simple OLS. The second is a panel data test with country fixed effects. The model estimated in both these tests is:

$$\textit{Excess Return, } (r_{i,t} - r_{f,t}) = \beta_{10} + \lambda_{cov}\, \textit{Covariance Risk}_{i,t} + \lambda_{var}\, \textit{Variance Risk}_{i,t} + \beta_{11}\, \textit{Foreign Exchange Risk}_{i,t} + \beta_{12}\, \textit{Liquidity}_{i,t} + \beta_{13}\, \textit{Liberalization}_{i,t} + \beta_{14}\, \textit{Insider Trading Law}_{i,t-1} + \beta_{15}\, \textit{Insider Trading Enforcement}_{i,t-1}$$

$+ \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ * *Emerging Market Dummy* $+ \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ * *Emerging Market Dummy* $+ e_{i,t}$

(8)

where

Excess Return is the monthly equity index return for each country minus the one month U.S. T-Bill Return, Covariance risk is the covariance of the country's equity index return with the world equity index return, Variance Risk is the variance of the country's equity index return, and the other variables are the same as defined in model (6).

Table III gives us the results of the OLS. As can be seen, the coefficient of the lagged insider trading law is insignificant, but the coefficient of the lagged insider trading law interacted with the emerging market dummy is significant and positive. This suggests that the cost of equity rises when an insider trading law is not enforced only in emerging markets, which is the same conclusion we obtained from our more sophisticated tests.

Table IV gives us the results of the panel data test with country fixed effects. As can be seen again, the coefficient of the lagged insider trading law is insignificant, but the coefficient of the lagged insider trading law interacted with the emerging market dummy is significant and positive. This suggests that the cost of equity rises when an insider trading law is not enforced only in emerging markets, which is the same conclusion we obtained earlier.

Our theoretical model focuses on the cost of equity that a corporation has to offer to raise equity in a country. So we had measured the cost of equity in a country. Our theoretical model also has something to say about liquidity: liquidity should be better in a country with no insider trading law than in a country with an unenforced insider trading law. We measure liquidity by the proportion of the number of zero daily returns to the number of all daily returns, as given in Bekaert et al. (2007). The higher is the proportion, the lower is the liquidity. The data is monthly, and is from December 1969. We use this new measure of

liquidity, and not our old measure if liquidity, which was turnover, because we have more data for this new measure. We re-estimate Equation (6), replacing the abnormal return of country i in month t, eit , with this measure of liquidity in country i in month t. Table V gives us the results. As can be seen in Panel A of Table V, we find that when an insider trading law is instituted but not enforced, liquidity decreases for all countries, emerging as well as developed. We also find that when an insider trading law is instituted and enforced, liquidity increases for all countries, emerging as well as developed. So, unlike the case of cost of equity, our results hold for all countries, not just emerging markets.

The model uses openness in trade, as measured by exports and imports, as a metric for financial market integration. This was done to make our model comparable to Bhattacharya and Daouk (2002). We now use foreign capital assets plus liabilities scaled by GDP as our openness measure, and re-estimate Equations (3), (5) and (6). Data on assets and liabilities come from Lane and Milesi-Ferretti (2007). The data is from January 1971. The results are given in Table A.I in the Appendix. As can be seen in Panel B of Table A.I, the coefficient of the lagged insider trading law is insignificant, but the coefficient of the lagged insider trading law interacted with the emerging market dummy is significant and positive. This suggests that the cost of equity rises when an insider trading law is not enforced only in emerging markets, which is the same conclusion we obtained earlier.

A critical variable of interest in our theoretical model is the number of law abiding investors in our economy. We had measured this crudely before using an emerging markets dummy variable, where the assumption is that emerging markets have fewer law abiding investors. We could do better. We first use the corruption index. The idea is that more the corruption in a country, the less is the number of law abiding citizens in that country. The data for the corruption index has been described before. The results are given in Table A.II. As model 1 in Table A.II is the same as model 1 in Table A.I, the numbers in Panel A in Table A.II are the same as the numbers in panel A in Table A.I. So we do not show it. We only show Panels B, C and D in Table A.II. As can be seen in Panel B in Table A.II, the coefficient of the lagged insider trading law is

positive and significant, and the coefficient of the lagged insider trading law interacted with corruption is negative and significant. Remembering that more corrupt countries have lower scores on this index, this means that when an insider trading law is instituted but not enforced, cost of equity decreases for less corrupt countries but increases for more corrupt countries. We next use a measure of the intensity of capital controls. The idea is that more the intensity of capital controls in a country, the less is the number of foreigners, the less is the number of law abiding citizens in that country. This measure is computed by Edison and Warnock (2003). The data for the market capitalization of the IFC Investable Index and the IFC Global Index comes from International Financial Corporation (IFC). The data begins in December 1969. The results are given in Table A.III. As model 1 in Table A.III is the same as model 1 in Table A.I, the numbers in Panel A in Table A.III are the same as the numbers in panel A in Table A.I. So we do not show it. We only show Panels B, C and D in Table A.III. As can be seen in Panel B in Table A.III, the coefficient of the lagged insider trading law is insignificant, but the coefficient of the lagged insider trading law interacted with the capital controls intensity is significant and positive. This means that when an insider trading law is instituted but not enforced, cost of equity increases only for countries with more capital controls intensity. We next used three other measures – proportion of foreign investors, an index measuring the protection afforded to minority shareholders, and a measure of trust. The idea is that more the proportion of foreign investors, or more the protection afforded to minority shareholders, or more the level of trust in the country, the more is the number of law abiding citizens in that country. The results are shown respectively in Panels B in Tables A.IV, A.V and A.VI. We do not get any significant results. The reason for insignificant results in Tables A.V and A.VI could be that the data on the last two variables are available only in cross-sectional form and not in a panel form. The panel data on the proportion of foreign investors come from Thomas et al. (2004). The data begins at December 1976. The cross-sectional data on the index measuring the protection afforded to minority investors come from La Porta et al. (1998). The data is for 1994. The cross-sectional data on the trust measure comes from the World Values Survey. The data is for 1990.

6. Conclusion

We do three things in this paper. We first formalize the conditions under which no law is better than a good law that is not enforced. Our answer is that we need two sufficient conditions. The first condition is that the motivation to enact the law should be to solve a prisoner's dilemma problem. This means that if there is no law, everyone is stuck in the bad equilibrium; if there is a law and it is enforced, the good equilibrium results. This is what makes a law a good law. The second condition is that there are some agents who will follow the law even if it is not enforced. If these assumptions hold, if a law is enacted but not enforced, only some will follow the law; the ones who do not follow the law will deviate with greater intensity in equilibrium, thereby causing law abiders more harm than they were incurring under no law.

We next ask whether insider trading laws satisfy the above conditions. Our answer is sometimes they do. This happens when corporate insiders have very imperfect information, if the cost of acquiring perfect information is not too high nor too low, and if there are many who will not follow the insider trading law if the insider trading law is not enforced.

We finally take our theory to the data. We ask whether the cost of equity rises when a country enacts an insider trading law but does not enforce it. We find the answer to be yes only for emerging markets. This is strong evidence in favor of our theoretical model, whose testable implication was that unenforced insider trading laws raise the cost of equity only when there are a large number of insiders trading with impunity (which is a likely occurrence in emerging markets.)

Our paper has strong policy implications, but these strong policy implications should not be exaggerated. Our paper does not say that no law is better than an unenforced good law for all types of laws and for all types of countries. So our paper does not suggest that we should adopt a good law only after being certain of its enforcement. What our paper shows, however, is that no law is better than an unenforced good law for only certain types of laws – laws which prohibit actions whose negative externality outweigh their positive internality (example, insider trading and many other types of securities laws) – and only for certain

types of countries – countries where there is lower respect for the rule of law. So our paper suggests that such type of laws should only be adopted in such types of countries if these laws are expected to be enforced. In practice, that would mean that unless institutions of enforcement of securities laws (example, office of market surveillance, knowledgeable courts and judges, etc) have been developed in more corrupt countries, the adoption of good securities law in these countries may have negative consequences. So, ultimately, our paper is really a cautionary memo to all policy makers who believe that welfare can be improved if only good laws were adopted in corrupt countries without paying much attention to the enforcement of these laws. Welfare may actually decrease.

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Table I. Summary statistics

	INSIDER TRADING VARIABLES		INSTITUTIONAL QUALITY VARIABLES			STOCK MARKET VARIABLES			
(1) Country (Period)	(2) Insider Trading Law	(3) Insider Trading Enforcement	(4) Mean corruption (1/84 to 12/98)	(5) Mean law and order (1/84 to 12/98)	(6) Mean bureaucracy quality (1/84 to 12/98)	(7) Mean monthly return	(8) Standard deviation of monthly returns	(9) Mean liquidity (Period)	(10) Liberalization date
Argentina (1975-1998)	1991	1995	3.4611	3.7222	2.0944	0.0167	0.2305	(1993-1998)	11/89
Australia (1969-1998)	1991	1996	5	6	4	0.0068	0.076	(1984-1998)	Before 12/69
Austria (1969-1998)	1993	No	4.9	6	3.85	0.0084	0.0601	(1986-1998)	Before 12/69
Belgium (1969-1998)	1990	1994	4.8833	5.8556	4	0.0131	0.0534	(1986-1998)	Before 12/69
Brazil (1975-1998)	1976	1978	3.6167	3.5333	2.9056	0.0064	0.1604	NA	05/91
Canada (1969-1998)	1966	1976	6	6	4	0.0076	0.0552	(1973-1998)	Before 12/69
Chile (1975-1998)	1981	1996	3.2111	4.3167	2.2	0.0189	0.102	(1989-1998)	01/92
China (1992-1998)	1993	No	3.5429	3.8971	2.1029	0.001	0.1456	(1991-1998)	NA
Colombia (1984-1998)	1990	No	2.7667	1.3667	2.8667	0.0188	0.0835	NA	02/91
Czech Republic (1993-1998)	1992	1993	4.1111	5.6111	3	-0.011	0.0938	NA	NA
Denmark (1969-1998)	1991	1996	6	6	4	0.0114	0.0536	(1988-1998)	Before 12/69
Egypt (1994-1998)	1992	No	2.4444	3	1.9333	0.0087	0.0749	NA	NA
Finland (1987-1998)	1989	1993	6	6	3.9639	0.0127	0.0809	NA	Before 12/69
France (1969-1998)	1967	1975	5.1397	5.324	3.9609	0.0104	0.0668	(1988-1998)	Before 12/69
Germany (1969-1998)	1994	1995	5.5152	5.8081	4	0.0102	0.0588	(1988-1998)	Before 12/69
Greece (1975-1998)	1988	1996	4.6333	4.1222	2.5444	0.0059	0.0948	(1988-1998)	12/87
Hong Kong (1969-1998)	1991	1994	4.8222	4.9556	2.8806	0.0141	0.1131	(1988-1998)	Before 12/69
Hungary (1992-1998)	1994	1995	4.6	5.2687	3.1829	0.0112	0.1191	NA	NA
India (1975-1998)	1992	1998	2.7778	2.7833	2.9611	0.0092	0.0783	(1995-1998)	11/92
Indonesia (1989-1998)	1991	1996	1.5333	2.9056	0.8833	-0.0126	0.1441	(1990-1998)	09/89
Ireland (1987-1998)	1990	No	4.7833	4.9278	3.7583	0.0127	0.0575	NA	Before 12/69
Israel (1996-1998)	1981	1989	4.8	3.4722	3.3444	0.0026	0.0685	NA	NA
Italy (1969-1998)	1991	1996	3.7611	5.2278	3.2111	0.0066	0.076	(1986-1998)	Before 12/69
Japan (1969-1998)	1988	1990	4.7722	5.4333	3.975	0.0103	0.06547	(1990-1998)	12/80
Jordan (1978-1998)	No	No	3.4667	3.1611	2.2056	0.0073	0.0476	NA	12/95
Korea (South)(1975-1998)	1976	1988	3.3722	3.4389	3.2028	0.008	0.1038	(1987-1998)	01/92
Luxembourg (1987-1998)	1991	No	5.8698	6	3.9941	0.0088	0.0506	NA	Before 12/69
Malaysia (1984-1998)	1973	1996	4.1389	4.2944	2.4556	0.0017	0.103	(1986-1998)	12/88
Mexico (1975-1998)	1975	No	2.9278	3.033	1.9333	0.107	0.1358	(1988-1998)	05/89
Morocco (1995-1998)	1993	No	2.7333	3.5667	2.1778	0.0264	0.0455	NA	NA
Netherlands (1969-1998)	1989	1994	6	6	4	0.0131	0.0513	(1986-1998)	Before 12/69
New Zealand (1987-1998)	1988	No	5.8333	5.9778	4	0.0027	0.0679	(1990-1998)	07/84
Nigeria (1984-1998)	1979	No	1.9444	1.9944	1.4222	0.0029	0.1567	NA	08/95
Norway (1969-1998)	1985	1990	5.8333	6	3.6861	0.0089	0.0789	(1980-1998)	Before 12/69
Pakistan (1984-1998)	1995	No	2.0611	2.25	1.95	0.0041	0.0886	NA	02/91
Peru (1992-1998)	1991	1994	2.9778	1.7889	1.0944	0.0077	0.0983	NA	NA
Philippines (1984-1998)	1982	No	2.1722	2.2222	0.9333	0.0181	0.11	(1990-1998)	06/91
Poland (1992-1998)	1991	1993	4.5714	4.7086	2.2457	0.0244	0.1765	(1994-1998)	NA
Portugal (1986-1998)	1986	No	4.6556	5.1611	2.5389	0.0056	0.0676	(1990-1998)	07/86
Russia (1995-1998)	1996	No	2.7738	3.4524	1.7976	-0.0061	0.2853	NA	NA
Saudi Arabia (1997-1998)	1990	No	2.2889	4.3444	2.5167	-0.0222	0.0434	NA	NA
Singapore (1969-1998)	1973	1978	4.6	5.2944	3.5472	0.0095	0.0875	(1983-1998)	01/92
Slovakia (1995-1998)	1992	No	3.7361	5.514	2.5167	-0.0185	0.082	NA	NA
South Africa (1992-1998)	1989	No	5.1333	2.4944	3.7167	0.0055	0.09	(1990-1998)	Before 12/69
Spain (1969-1998)	1994	1998	4.2778	4.7444	3.0583	0.009	0.0661	(1990-1998)	Before 12/69
Sweden (1969-1998)	1971	1990	6	6	4	0.0126	0.0638	(1982-1998)	Before 12/69
Switzerland (1969-1998)	1988	1995	5.8333	6	4	0.0116	0.0552	(1989-1998)	Before 12/69
Sri Lanka (1992-1998)	1987	1996	3.1722	1.6778	2	-0.0025	0.0897	NA	NA
Taiwan (1984-1998)	1988	1989	3.8667	4.8667	3.225	0.0126	0.1323	(1991-1998)	01/91
Thailand (1975-1998)	1984	1993	2.9278	4.1444	3.1556	0.00737	0.0989	(1987-1998)	09/87
Turkey (1986-1998)	1981	1996	2.8778	3.3944	2.3722	0.0128	0.1829	(1988-1998)	08/89
United Kingdom (1969-1998)	1980	1981	5.2611	5.25	4	0.0109	0.0675	(1986-1998)	Before 12/69
United States (1969-1998)	1934	1961	4.8889	6	4	0.0103	0.0444	(1973-1998)	Before 12/69
Venezuela (1984-1998)	1998	No	2.9611	3.9722	1.9056	0.008	0.1467	NA	01/90
Zimbabwe (1975-1998)	No	No	3.1778	2.7778	2.6111	0.0019	0.1075	NA	06/93

Notes and Sources:

(1) Data on monthly stock market indices for the 22 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 33 emerging markets were obtained from the International Financial Corporation (IFC). These countries are listed in Column 1. The periods for which this data were obtained are also listed in Column 1.
(2) The dates in Column 2 come from column 7 in Table I of Bhattacharya and Daouk (2002).
(3) The dates in Column 3 come from column 8 in Table I of Bhattacharya and Daouk (2002).
(4) Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). The average of this variable for the period January 1984 through December 1998 is given in Column 4. Source: International Country Risk Guide of the PRS Group.
(5) Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). The average of the sum of these two variables for the period January 1984 through December 1998 is given in Column 5. Source: International Country Risk Guide of the PRS Group.
(6) Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). The average of this variable for the period January 1984 through December 1998 is given in Column 6. Source: International Country Risk Guide of the PRS Group.
(7) The mean monthly return of the 22 developed countries and the 33 emerging markets is given in Column 7. The sample periods used to calculate these statistics are given in Column 1.
(8) The standard deviations of monthly returns of the 22 developed countries and the 33 emerging markets is given in Column 8. The sample periods used to calculate these statistics are given in Column 1.
(9) Liquidity is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. Monthly data on these two variables were obtained from Datastream. The sample period used to estimate this mean is given in Column 9.
(10) The official liberalization date, which was obtained from column 1 in Table I of Bekaert and Harvey (2000), is given in Column 10.

Table II. Effect of insider trading on the cost of equity

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 as

$$\phi_{i,t} \equiv \frac{\exp\left(\alpha_1\left(\frac{\exp orts_{i,t} + imports_{i,t}}{gdp_{i,t}}\right)\right)}{1+\exp\left(\alpha_1\left(\frac{\exp orts_{i,t} + imports_{i,t}}{gdp_{i,t}}\right)\right)}$$

and 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 below:

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

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

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

Dependent variable [b]	Excess return of country
Some independent variables [c]	
Covariance of the country's equity return with the world equity return multiplied by the measure of the country's integration with the world	λ_{cov} = 2.2157 (0.0471)
Variance of the country's equity return multiplied by one minus the measure of the country's integration with the world	λ_{var} = 2.3984 (0.0615)

[a] The numbers below are coefficient estimates from the panel regressions described above. p-values are in parentheses.
[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 22 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 33 emerging markets were obtained from the International Financial Corporation (IFC). The sample periods are given in the Appendix. The data for the one-month U.S. Treasury bill return was obtained from Datastream.
[c] The measure of a country's integration with the world, as defined above, is computed from its exports, imports, and GDP. It is Equation (5) 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 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 below.

$$
\begin{aligned}
r_{i,t} &= f_1 + \varepsilon_{i,t}\,, \\
r_{ifx,t} &= f_2 + \varepsilon_{ifx,t}\,, \\
h_{i,t} &= e_1 + d_1\left(\tfrac{1}{2}\varepsilon^2_{i,t-1} + \tfrac{1}{3}\varepsilon^2_{i,t-2} + \tfrac{1}{6}\varepsilon^2_{i,t-3}\right), \\
h_{ifx,t} &= e_2 + d_2\left(\tfrac{1}{2}\varepsilon^2_{ifx,t-1} + \tfrac{1}{3}\varepsilon^2_{ifx,t-2} + \tfrac{1}{6}\varepsilon^2_{ifx,t-3}\right), \\
h_{i,ifx,t} &= e_3 + d_3\left(\tfrac{1}{2}\varepsilon_{i,t-1}\varepsilon_{ifx,t-1} + \tfrac{1}{3}\varepsilon_{i,t-2}\varepsilon_{ifx,t-2} + \tfrac{1}{6}\varepsilon_{i,t-3}\varepsilon_{ifx,t-3}\right), \\
\varepsilon_{i,t}\,,\varepsilon_{ifx,t} &\sim \mathrm{N}\left(\begin{bmatrix}0\\0\end{bmatrix},\begin{bmatrix} h_{i,t} & h_{i,ifx,t} \\ h_{i,ifx,t} & h_{ifx,t}\end{bmatrix}\right).
\end{aligned}
$$

where

$\varepsilon_{i,\,t-j}$ is the innovation in monthly return of the stock market index of country i at time t-j, j ε {0,1,2,3}, and $\varepsilon_{ifx,\,t-j}$ is the innovation in monthly depreciation of the i^{th} foreign currency with respect to the dollar at time t-j, j ε {0,1,2,3}.

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ ** Emerging Market Dummy +* β_{17} *Insider Trading Enforcement*$_{i,t-1}$ ** Emerging Market Dummy +* $u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	6.2615	1.4225	0.0000
Liquidity [d]	0.0065	0.0015	0.0000
Liberalization [e]	-0.0100	0.0039	0.0097
Lagged insider trading law [f]	0.0005	0.0044	0.9135
Lagged insider trading enforcement [g]	-0.0085	0.0051	0.0940
Lagged insider trading law*emerging market dummy [k]	0.0264	0.0091	0.0039
Lagged insider trading enforcement law*emerging market dummy [k]	-0.0342	0.0083	0.0000

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0756	0.0802	0.3459
Corruption [h]	-0.1188	0.0111	0.0000
Law and order [i]	0.1045	0.0115	0.0000
Bureaucracy quality [j]	0.2128	0.0220	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1581	0.0750	0.0349
Corruption [h]	-0.1244	0.0104	0.0000
Law and order [i]	0.1013	0.0108	0.0000
Bureaucracy quality [j]	0.0985	0.0206	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.
[b] This variable is the residual from Model 1.
[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.
[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.
[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.
[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.
[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.
[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.
[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.
[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.
[k] Emerging market dummy is 1 for emerging markets, and 0 for developed countries.

Table III. Effect of insider trading on the cost of equity using OLS

MODEL:

The international asset pricing factor model used is

$$\textit{Excess Return, } (r_{i,t} - r_{f,t}) = \beta_{10} + \lambda_{cov}\, \textit{Covariance Risk}_{i,t} + \lambda_{var}\, \textit{Variance Risk}_{i,t} + \beta_{11}\, \textit{Foreign Exchange Risk}_{i,t} + \beta_{12}\, \textit{Liquidity}_{i,t} + \beta_{13}\, \textit{Liberalization}_{i,t} + \beta_{14}\, \textit{Insider Trading Law}_{i,t-1} + \beta_{15}\, \textit{Insider Trading Enforcement}_{i,t-1} + \beta_{16}\, \textit{Insider Trading Law}_{i,t-1} * \textit{Emerging Market Dummy} + \beta_{17}\, \textit{Insider Trading Enforcement}_{i,t-1} * \textit{Emerging Market Dummy} + e_{i,t}$$

Panel A: Coefficients of the equation in the Model [a]

Dependent variable [b]	Excess return of country		
Independent variables	Coefficient	Standard Error	p-value
Covariance risk , $h_{i,w,t}$ [c]	4.5659	3.1932	0.1528
Variance risk, $h_{i,t}$ [d]	-0.1003	0.3506	0.7749
Foreign exchange risk, $h_{i,ifx,t}$ [e]	1.5683	0.8984	0.0809
Liquidity [f]	0.0033	0.0013	0.0136
Liberalization [g]	0.0113	0.0063	0.0710
Lagged insider trading law [h]	-0.0016	0.0057	0.7851
Lagged insider trading enforcement [i]	-0.0005	0.0041	0.9082
Lagged insider trading law*emerging market dummy [j]	0.0114	0.0053	0.0301
Lagged insider trading enforcement law*emerging market dummy [j]	-0.0249	0.0092	0.0071

[a] The numbers below are results from ordinary least squares regressions, and are corrected for country-specific heteroskedasticity and country-specific autocorrelation.
[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 22 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 33 emerging markets were obtained from the International Financial Corporation (IFC). The sample periods are given in the Appendix. The data for the one-month U.S. Treasury bill return was obtained from Datastream.
[c] The control variable "covariance risk" is the covariance of the country's equity return with the world equity return.
[d] The control variable "variance risk" is the variance of the country's equity return.
[e] The control variable "foreign exchange risk" is the 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.
[f] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.
[g] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.
[h] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.
[i] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.
[j] Emerging market dummy is 1 for emerging markets, and 0 for developed countries.

Table IV. Effect of insider trading on the cost of equity using panel fixed effects

MODEL:

The international asset pricing factor model used is

$$\textit{Excess Return, } (r_{i,t} - r_{f,t}) = \beta_{10} + \lambda_{cov}\, \textit{Covariance Risk}_{i,t} + \lambda_{var}\, \textit{Variance Risk}_{i,t} + \beta_{11}\, \textit{Foreign Exchange Risk}_{i,t} + \beta_{12}\, \textit{Liquidity}_{i,t} + \beta_{13}\, \textit{Liberalization}_{i,t} + \beta_{14}\, \textit{Insider Trading Law}_{i,t-1} + \beta_{15}\, \textit{Insider Trading Enforcement}_{i,t-1} + \beta_{16}\, \textit{Insider Trading Law}_{i,t-1} * \textit{Emerging Market Dummy} + \beta_{17}\, \textit{Insider Trading Enforcement}_{i,t-1} * \textit{Emerging Market Dummy} + e_{i,t}$$

Panel A: Coefficients of the equation in the Model [a]

Dependent variable [b]	Excess return of country		
Independent variables	Coefficient	Standard Error	p-value
Covariance risk , $h_{i,w,t}$ [c]	4.7438	3.2401	0.1432
Variance risk, $h_{i,t}$ [d]	-0.1734	0.2139	0.4174
Foreign exchange risk, $h_{i,ifx,t}$ [e]	3.9929	1.1926	0.0008
Liquidity [f]	0.0079	0.0015	0.0000
Liberalization [g]	-0.0097	0.0040	0.0145
Lagged insider trading law [h]	-0.0001	0.0044	0.9759
Lagged insider trading enforcement [i]	-0.0049	0.0049	0.3200
Lagged insider trading law*emerging market dummy [j]	0.0211	0.0092	0.0222
Lagged insider trading enforcement law*emerging market dummy [j]	-0.0284	0.0081	0.0004

[a] The numbers below are results from panel fixed effects regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[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 22 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 33 emerging markets were obtained from the International Financial Corporation (IFC). The sample periods are given in the Appendix. The data for the one-month U.S. Treasury bill return was obtained from Datastream.

[c] The control variable "covariance risk" is the covariance of the country's equity return with the world equity return.

[d] The control variable "variance risk" is the variance of the country's equity return.

[e] The control variable "foreign exchange risk" is the 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.

[f] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[g] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[h] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[i] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[j] Emerging market dummy is 1 for emerging markets, and 0 for developed countries.

Table V. Effect of insider trading on liquidity

MODEL (A Panel VAR Model):

$Liquidity_{i,t} = \beta_{10} + \beta_{11}\ Liberalization_{i,t} + \beta_{12}\ Insider\ Trading\ Law_{i,t-1} + \beta_{13}\ Insider\ Trading\ Enforcement_{i,t-1} + \beta_{14}\ Insider\ Trading\ Law_{i,t-1} * Emerging\ Market\ Dummy + \beta_{15}\ Insider\ Trading\ Enforcement_{i,t-1} * Emerging\ Market\ Dummy + u_{1i,t}$

and

$Insider\ Trading\ Law_{i,t} = \beta_{20} + \beta_{21}\ Liquidity_{i,t-1} + \beta_{22}\ Corruption_{i,t} + \beta_{23}\ Law\ and\ Order_{i,t} + \beta_{24}\ Bureaucracy\ Quality_{i,t} + u_{2i,t}$

and

$Insider\ Trading\ Enforcement_{i,t} = \beta_{30} + \beta_{31}\ Liquidity_{i,t-1} + \beta_{32}\ Corruption_{i,t} + \beta_{33}\ Law\ and\ Order_{i,t} + \beta_{34}\ Bureaucracy\ Quality_{i,t} + u_{3i,t}$

Panel A: Coefficients of the first equation in the Model [a]

Dependent variable	Liquidity [b]		
Independent variables	Coefficient	Standard Error	p-value
Liberalization [c]	-0.0355	0.0042	0.0000
Lagged insider trading law [d]	0.0230	0.0056	0.0000
Lagged insider trading enforcement [e]	-0.0314	0.0065	0.0000
Lagged insider trading law*emerging market dummy [i]	0.0022	0.0105	0.8327
Lagged insider trading enforcement law*emerging market dummy [i]	-0.0079	0.0103	0.4465

Panel B: Coefficients of the second equation in the Model [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged liquidity [b]	0.0950	0.0424	0.0252
Corruption [f]	-0.1088	0.0088	0.0000
Law and order [g]	0.1410	0.0082	0.0000
Bureaucracy quality [h]	0.1162	0.0160	0.0000

Panel C: Coefficients of the third equation in the Model [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged liquidity [b]	-0.1484	0.0389	0.0001
Corruption [f]	-0.0826	0.0080	0.0000
Law and order [g]	0.0911	0.0075	0.0000
Bureaucracy quality [h]	0.0600	0.0147	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] The dependent variable is liquidity. We measure liquidity by the proportion of the number of zero returns to the number of all returns, as given in Bekaert et al. (2007). The higher is the proportion, the lower is the liquidity. The data is monthly, and is from December 1969.

[c] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[d] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[e] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[f] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[g] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[h] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

[i] Emerging market dummy is 1 for emerging markets, and 0 for developed countries.

APPENDIX

Table A.I. Effect of insider trading on the cost of equity using a different measure of market integration

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 as
and λ_{cov} is the price of the covariance risk with the world, and λ_{var} is the price of own country variance risk. The

$$\phi_{i,t} \equiv \frac{\exp\left(\alpha_1\left(\frac{assets_{i,t} + liabilities_{i,t}}{gdp_{i,t}}\right)\right)}{1 + \exp\left(\alpha_1\left(\frac{assets_{i,t} + liabilities_{i,t}}{gdp_{i,t}}\right)\right)}$$

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 below:

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

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

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

Dependent variable [b]	Excess return of country
Some independent variables [c]	
Covariance of the country's equity return with the world equity return multiplied by the measure of the country's integration with the world	λ_{cov} = 2.6845 (0.0150)
Variance of the country's equity return multiplied by one minus the measure of the country's integration with the world	λ_{var} = 3.7212 (0.6941)

[a] The numbers below are coefficient estimates from the panel regressions described above. p-values are in parentheses.

[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 22 developed markets were obtained from Morgan Stanley Capital Market International (MSCI). Data on monthly stock market indices for the 33 emerging markets were obtained from the International Financial Corporation (IFC). The sample periods are given in Table I. The data for the one-month U.S. Treasury bill return was obtained from Datastream.

[c] The measure of a country's integration with the world, as defined above, is computed from its assets, liabilities, and GDP. Data on quarterly/annual GDP were from the International Financial Statistics of the International Monetary Fund. Data on assets and liabilities come from Lane and Milesi-Ferretti (2007).

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 below.

$$
\begin{aligned}
r_{i,t} &= f_1 + \varepsilon_{i,t}\,, \\
r_{ifx,t} &= f_2 + \varepsilon_{ifx,t}\,, \\
h_{i,t} &= e_1 + d_1\left(\tfrac{1}{2}\varepsilon^2_{i,t-1} + \tfrac{1}{3}\varepsilon^2_{i,t-2} + \tfrac{1}{6}\varepsilon^2_{i,t-3}\right), \\
h_{ifx,t} &= e_2 + d_2\left(\tfrac{1}{2}\varepsilon^2_{ifx,t-1} + \tfrac{1}{3}\varepsilon^2_{ifx,t-2} + \tfrac{1}{6}\varepsilon^2_{ifx,t-3}\right), \\
h_{i,ifx,t} &= e_3 + d_3\left(\tfrac{1}{2}\varepsilon_{i,t-1}\varepsilon_{ifx,t-1} + \tfrac{1}{3}\varepsilon_{i,t-2}\varepsilon_{ifx,t-2} + \tfrac{1}{6}\varepsilon_{i,t-3}\varepsilon_{ifx,t-3}\right), \\
\varepsilon_{i,t}\,,\varepsilon_{ifx,t} &\sim \mathrm{N}\left(\begin{bmatrix}0\\0\end{bmatrix},\begin{bmatrix} h_{i,t} & h_{i,ifx,t} \\ h_{i,ifx,t} & h_{ifx,t}\end{bmatrix}\right).
\end{aligned}
$$

where

$\varepsilon_{i,\,t-j}$ is the innovation in monthly return of the stock market index of country i at time t-j, j ε {0,1,2,3}, and $\varepsilon_{ifx,\,t-j}$ is the innovation in monthly depreciation of the i^{th} foreign currency with respect to the dollar at time t-j, j ε {0,1,2,3}.

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ ** Emerging Market Dummy +* β_{17} *Insider Trading Enforcement*$_{i,t-1}$ ** Emerging Market Dummy +* $u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	4.0857	1.2072	0.0007
Liquidity [d]	0.0080	0.0016	0.0000
Liberalization [e]	-0.0091	0.0040	0.0233
Lagged insider trading law [f]	-0.0002	0.0047	0.9572
Lagged insider trading enforcement [g]	-0.0081	0.0053	0.1284
Lagged insider trading law*emerging market dummy [k]	0.0232	0.0094	0.0138
Lagged insider trading enforcement law*emerging market dummy [k]	-0.0286	0.0083	0.0006

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0706	0.0732	0.3343
Corruption [h]	-0.1221	0.0109	0.0000
Law and order [i]	0.1232	0.0108	0.0000
Bureaucracy quality [j]	0.1842	0.0201	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1404	0.0692	0.0425
Corruption [h]	-0.1375	0.0103	0.0000
Law and order [i]	0.1175	0.0102	0.0000
Bureaucracy quality [j]	0.0943	0.0190	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] This variable is the residual from Model 1.

[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.

[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

[k] Emerging market dummy is 1 for emerging markets, and 0 for developed countries.

Table A.II. Effect of insider trading on the cost of equity using corruption

MODEL 1 and Panel A: Same as in Table A.I

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ * *Corruption*$_{i,t-1} + \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ * *Corruption*$_{i,t-1} + u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	4.1858	1.2084	0.0005
Liquidity [d]	0.0083	0.0016	0.0000
Liberalization [e]	-0.0087	0.0035	0.0144
Lagged insider trading law [f]	0.0300	0.0083	0.0003
Lagged insider trading enforcement [g]	-0.0417	0.0094	0.0000
Lagged insider trading law*corruption	-0.0057	0.0020	0.0041
Lagged insider trading enforcement law*corruption	0.0052	0.0021	0.0144

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0686	0.0733	0.3488
Corruption [h]	-0.1230	0.0109	0.0000
Law and order [i]	0.1237	0.0108	0.0000
Bureaucracy quality [j]	0.1841	0.0201	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1441	0.0693	0.0375
Corruption [h]	-0.1386	0.0103	0.0000
Law and order [i]	0.1182	0.0103	0.0000
Bureaucracy quality [j]	0.0941	0.0190	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] This variable is the residual from Model 1.

[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.

[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

Table A.III. Effect of insider trading on the cost of equity using capital controls intensity

MODEL 1 and Panel A: Same as in Table A.I

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ * *Capital Controls Intensity*$_{i,t-1} + \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ * *Capital Controls Intensity*$_{i,t-1} + u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	4.4231	1.1929	0.0002
Liquidity [d]	0.0078	0.0016	0.0000
Liberalization [e]	-0.0059	0.0036	0.0143
Lagged insider trading law [f]	0.0011	0.0041	0.7927
Lagged insider trading enforcement [g]	-0.0123	0.0045	0.0059
Lagged insider trading law*capital controls Intensity [k]	0.0629	0.0149	0.0000
Lagged insider trading enforcement law*capital controls Intensity [k]	-0.0482	0.0184	0.0088

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0735	0.0763	0.3353
Corruption [h]	-0.1277	0.0112	0.0000
Law and order [i]	0.1341	0.0112	0.0000
Bureaucracy quality [j]	0.1762	0.0207	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1341	0.0720	0.0626
Corruption [h]	-0.1491	0.0106	0.0000
Law and order [i]	0.1136	0.0106	0.0000
Bureaucracy quality [j]	0.1034	0.0195	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] This variable is the residual from Model 1.

[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.

[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

[k] Capital controls intensity is computed by Edison and Warnock (2003). The data for the market capitalization of the IFC Investable Index and the IFC Global Index comes from International Financial Corporation (IFC). The data begins in December 1969. The higher is the number, the higher is restriction on foreigners.

Table A.IV. Effect of insider trading on the cost of equity using proportion of foreign investors

MODEL 1 and Panel A: Same as in Table A.I

M*ODEL 2 (A Panel VAR Model):*

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ ** Proportion of Foreign Investors*$_{i,t-1} + \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ ** Proportion of Foreign Investors*$_{i,t-1} + u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	4.3692	1.2320	0.0004
Liquidity [d]	0.0080	0.0017	0.0000
Liberalization [e]	-0.0076	0.0038	0.0449
Lagged insider trading law [f]	0.0069	0.0063	0.2745
Lagged insider trading enforcement [g]	-0.0166	0.0077	0.0315
Lagged insider trading law*proportion of foreign investors [k]	0.0102	0.0599	0.8647
Lagged insider trading enforcement law*proportion of foreign investors [k]	-0.0325	0.0663	0.6236

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0769	0.0770	0.3179
Corruption [h]	-0.1269	0.0115	0.0000
Law and order [i]	0.1250	0.0113	0.0000
Bureaucracy quality [j]	0.1842	0.0209	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1449	0.0728	0.0466
Corruption [h]	-0.1450	0.0109	0.0000
Law and order [i]	0.1186	0.0106	0.0000
Bureaucracy quality [j]	0.0962	0.0197	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.
[b] This variable is the residual from Model 1.
[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.
[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.
[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.
[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.
[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.
[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.
[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.
[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.
[k] Proportion of foreign investors come from Thomas et al. (2004). The data begins at December 1976.

Table A.V. Effect of insider trading on the cost of equity using minority protection

MODEL 1 and Panel A: Same as in Table A.I

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ ** Minority Protection*$_{i,} + \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ ** Minority Protection*$_{i,} + u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	4.2031	1.2090	0.0005
Liquidity [d]	0.0081	0.0016	0.0000
Liberalization [e]	-0.0095	0.0043	0.0260
Lagged insider trading law [f]	0.0068	0.0047	0.1502
Lagged insider trading enforcement [g]	-0.0174	0.0059	0.0032
Lagged insider trading law*minority protection [k]	0.0008	0.0011	0.4756
Lagged insider trading enforcement law*minority protection [k]	-0.0010	0.0015	0.4780

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	0.0708	0.0732	0.3330
Corruption [h]	-0.1221	0.0109	0.0000
Law and order [i]	0.1232	0.0108	0.0000
Bureaucracy quality [j]	0.1842	0.0201	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.1403	0.0692	0.0426
Corruption [h]	-0.1375	0.0103	0.0000
Law and order [i]	0.1174	0.0102	0.0000
Bureaucracy quality [j]	0.0942	0.0190	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] This variable is the residual from Model 1.

[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.

[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

[k] The cross-sectional data on the index measuring the protection afforded to minority investors come from Table 2 in La Porta et al. (1998). The data is for 1994. The index is obtained by adding one when: (a) there is one share-one vote rule; (b) the country allows shareholders to mail their proxy vote to the firm; (c) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (d) cumulative voting or proportional representation of minorities in the board of directors is allowed; (e) an oppressed minorities mechanism is in place; and (f) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median). The index ranges from 0 to 6.

Table A.VI. Effect of insider trading on the cost of equity controlling for trust

MODEL 1 and Panel A: Same as in Table A.I

MODEL 2 (A Panel VAR Model):

Residual from Model 1, $e_{i,t} = \beta_{10} + \beta_{11}$ *Foreign Exchange Risk*$_{i,t} + \beta_{12}$ *Liquidity*$_{i,t} + \beta_{13}$ *Liberalization*$_{i,t} + \beta_{14}$ *Insider Trading Law*$_{i,t-1} + \beta_{15}$ *Insider Trading Enforcement*$_{i,t-1} + \beta_{16}$ *Insider Trading Law*$_{i,t-1}$ * *Trust*$_i + \beta_{17}$ *Insider Trading Enforcement*$_{i,t-1}$ * *Trust*$_i + u_{1i,t}$

and

Insider Trading Law$_{i,t} = \beta_{20} + \beta_{21}\, e_{i,t-1} + \beta_{22}$ *Corruption*$_{i,t} + \beta_{23}$ *Law and Order*$_{i,t} + \beta_{24}$ *Bureaucracy Quality*$_{i,t} + u_{2i,t}$

and

Insider Trading Enforcement$_{i,t} = \beta_{30} + \beta_{31}\, e_{i,t-1} + \beta_{32}$ *Corruption*$_{i,t} + \beta_{33}$ *Law and Order*$_{i,t} + \beta_{34}$ *Bureaucracy Quality*$_{i,t} + u_{3i,t}$

Panel B: Coefficients of the first equation in Model 2 [a]

Dependent variable	Residual from Risk Adjustment Model (1) [b]		
Independent variables	Coefficient	Standard Error	p-value
Foreign exchange risk, $h_{i,ifx,t}$ [c]	9.6586	1.7365	0.0000
Liquidity [d]	0.0064	0.0015	0.0000
Liberalization [e]	-0.0089	0.0045	0.0483
Lagged insider trading law [f]	0.0359	0.0329	0.2756
Lagged insider trading enforcement [g]	0.0351	0.0446	0.4311
Lagged insider trading law*trust [k]	-0.0131	0.0121	0.2798
Lagged insider trading enforcement law*trust [k]	-0.0167	0.0162	0.3007

Panel C: Coefficients of the second equation in Model 2 [a]

Dependent variable	Insider Trading Law [f]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.0047	0.1144	0.9671
Corruption [h]	-0.1964	0.0143	0.0000
Law and order [i]	0.2129	0.0149	0.0000
Bureaucracy quality [j]	0.2291	0.0387	0.0000

Panel D: Coefficients of the third equation in Model 2 [a]

Dependent variable	Insider Trading Enforcement [g]		
Independent variables	Coefficient	Standard Error	p-value
Lagged residual from risk adjustment model [b]	-0.0661	0.1072	0.5372
Corruption [h]	-0.1224	0.0134	0.0000
Law and order [i]	0.1635	0.0140	0.0000
Bureaucracy quality [j]	0.2888	0.0362	0.0000

[a] The numbers below are results from panel VAR regressions, and are corrected for country fixed-effects, country-specific heteroskedasticity and country-specific autocorrelation.

[b] This variable is the residual from Model 1.

[c] The control variable "foreign exchange risk" is estimated from the multivariate ARCH model given above.

[d] The control variable "liquidity" is defined as the natural logarithm of the ratio of volume of dollar trade per month to dollar market capitalization at the end of the month. This data were obtained from Datastream for the main stock market of each country. The sample periods for which this data were available are given in column 9 in Table I.

[e] The control variable "Liberalization" is an indicator variable. It changes from 0 to 1 in the month after the official liberalization date. This date was obtained from Bekaert and Harvey (2000). These liberalization dates are given in column 10 of Table I.

[f] Insider Trading $Law_{i,t}$ in country i is 1 for t=L+1,L+2,...and is 0 for the other years, where L is the year the insider trading law is enacted. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 2 of Table I.

[g] Insider Trading $Enforcement_{it}$ in country i is exp(-t) for t=L+1, L+2,...E; and is 1 for t=E+1, E+2, ...; and is 0 for the other years, where L is the year the insider trading law is enacted and E is the year there is a first prosecution. These dates were obtained from Bhattacharya and Daouk (2002). These dates are given in column 3 of Table I.

[h] Corruption is a monthly measure of corruption within the political system; it can range from 0 (most corrupt) to 6 (least corrupt). Source: International Country Risk Guide of the PRS Group.

[i] Law and Order is the sum of two monthly sub-components; the Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law; each sub-component can range from 0 (lowest) to 3 (highest). Source: International Country Risk Guide of the PRS Group.

[j] Bureaucracy Quality is a monthly measure of the institutional strength and quality of the bureaucracy. It can range from 0 (worst) to 4 (best). Source: International Country Risk Guide of the PRS Group.

[k] The cross-sectional data on the trust measure comes from the World Values Survey. The data is for 1990. The higher is the number, the higher is the level of trust.

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