The World Price of Insider Trading☆

Utpal Bhattacharya [a]

Hazem Daouk [a]

JEL Classification: G14, G15
Keywords: Insider trading; Cost of Equity; Emerging markets

[a]*Kelley School of Business, Indiana University, Bloomington, IN 47405, USA*

Tel.: 812-855-3413; fax: 812-855-5875. E-Mail address: ubhattac@indiana.edu and hdaouk@indiana.edu

☆This paper would not be possible without the information we received from the regulators and the representatives of the 103 stock markets that we contacted. We are deeply indebted to them. The first author is grateful to KAIST, South Korea, for allowing him the use of their Datastream data source when he was a visiting scholar there in the summer of 1999. Any remaining errors in this paper are our own.

Abstract

The existence and the enforcement of insider trading laws in stock markets is a phenomenon of the 1990s. A study of the 103 countries that have stock markets reveals that insider trading laws exist in 87 of them, but enforcement -- as evidenced by prosecutions -- has taken place in only 38 of them. Before 1990, the respective numbers were 34 and 9. Does this matter? This is an important question, because though scores of law, economics and finance papers have argued the pros and cons of insider trading regulations, no study has yet empirically documented whether prohibitions against insider trading affect the cost of equity.

This paper finds that it is the enforcement, not the existence of insider trading laws, that matters. We find that the cost of equity in a country (after controlling for risk factors, a liquidity factor, and other shareholder rights) is reduced by about 5% if insider trading laws are enforced.

THE WORLD PRICE OF INSIDER TRADING

An Insider (Primary or Secondary Insider) may not, by utilizing knowledge of Insider Information, acquire or dispose of Insider Securities for his or her own account or for the account of another person, or for another person.

Section 14 of the WpHG, Germany, 1994

Laws prohibiting insider trading came late to Germany. They had to come because the European Union required all its members to implement the European Community Insider Trading Directive (89/592/EEC of November 13, 1989). The lateness of Germany in establishing laws prohibiting insider trading, however, was not an exception. Posen (1991) notes that in the beginning of this decade insider trading was not illegal in most European countries.

Scores of law, economics and finance papers have argued the pros and cons of insider trading regulations. Bainbridge (1998), besides providing a list of the 261 papers that have discussed insider trading, succinctly summarizes the arguments for and against allowing insider trading.[1] Manne (1966) provided the classic argument against the ban on insider trading: a ban would adversely effect market efficiency and it would impede an effective way to compensate managers. The economic arguments for regulation, besides disputing Manne's (1966) assertions, have stated that a ban would reduce adverse selection costs and increase liquidity, improve confidence in the market, reduce interference in corporate plans, improve investments and welfare, and motivate large shareholders to monitor management instead of seeking to profit from inside information. The legal arguments for a ban have been converging to the view that inside

[1] A partial list of papers on insider trading in the financial economics literature would include Agrawal and Jaffe (1995), Allen and Gale (1992), Ausubel (1990), Back (1992), Bagnoli and Khanna (1992), Bebchuk and Fershtman (1994), Bernhardt, Hollifield and Hughson (1995), Bhattacharya and Spiegel (1991), Biais and Hillion (1994), Cornell and Sirri (1992), Damodaran and Liu (1993), DeMarzo, Fishman and Hagerty (1998), Demsetz (1986), Dutta and Madhavan (1995), Dye (1984), Finnerty (1976), Fishman and Hagerty (1992), Givoly and Palmon (1985), Glosten (1989), Grossman (1986), Heinkel and Kraus (1987), Hirshleifer (1971), Jarrell and Poulsen (1989), John and Narayanan (1997), Khanna, Slezak and Bradley (1994), Kyle (1985), Laffont and Maskin (1990), Leland (1992), Lin and Howe (1990), Manove (1989), Maug (1999), Meulbroek (1992), Penman (1985), Rochet and Vila (1994), Rozeff and Zaman (1988), Seyhun (1986, 1992), and Shin (1996).

information may be a property of the corporation, and trading on that may be theft.[2]

The debate about insider trading will eventually have to be settled empirically. However, as Bainbridge (1998) notes, serious empirical research on insider trading is hindered by the subject's illegality. The only source of data concerning legal trades are the trading reports filed by corporate insiders, and it is unlikely that managers will willingly report their violations. Even if they do, it is improbable that managers are the only insiders. The only source of data concerning illegal trades is confidential, and if any researcher (for example, Meulbroek (1992)) obtains them, the study will suffer from a selection bias. It should also be mentioned here that because of availability of data, and because of a long evolution of common law on insider trading, nearly all empirical research on insider trading has been concentrated in the Unites States[3]. Conclusions based on a sample size of one tend not to be robust.

The purpose of this paper is twofold. First, we carry out a comprehensive survey on the existence and the enforcement (as measured by a prosecution) of insider trading laws around the world. Stamp and Welsh (1996), in a survey of insider trading laws in a small subset of developed countries, did not like what they found. We quote them: "in conclusion, it is clear that a number of jurisdictions are either not interested in, or are not prepared to devote the necessary resources to implementing their insider dealing legislation..." We update their data set by obtaining information on insider trading laws in every country that has a stock market. To preclude any selection bias, we begin the second part of the paper only after we have obtained information from *all* these countries.

The second purpose of the paper is to ask whether the existence and enforcement of insider trading laws matter. To be precise, the research question is whether prohibitions against insider trading affect the cost of equity. This is an important question because, as a major purpose of stock markets is to facilitate

---

[2] John Bagby of Penn State University is developing a bibliography of the law papers on insider trading (see http://www2.smeal.psu.edu/courses/bagby/it-biblio.html)

[3] The first prosecution for insider trading occurred in the U.S.A under state law as early as 1903 (Oliver v. Oliver, 45 S.E. 232 Georgia, 1903).

corporations raise financing through equity, corporations would like to know if they have to pay an extra insider trading premium in stock markets where insiders trade with impunity. If yes, it would be in the benefit of corporations to have their equity traded in stock markets that limit insider trading.

These are our findings from our comprehensive survey of stock markets around the world. We find that at the end of 1998 there were 103 countries that had stock markets. They exhibited a bewildering diversity. The ages of the stock markets ranged from a few months (1998, Tanzania) to hundreds of years (1585, Germany). Volume of trade ranged from 0.0003 billion USD (1998, Tanzania) to 5777.6 billion USD (1997, New York Stock Exchange). The number of listed firms ranged from 2 (1997, Macedonia) to 5843 (1997, India). There was also a wide variation in the existence and enforcement of insider trading laws. Insider trading laws existed in 87 of them, but enforcement -- as evidenced by prosecutions -- had taken place in only 38 of them. Before 1990, the respective numbers were 34 and 9. This leads us to conclude that the existence and the enforcement of insider trading laws in stock markets is a phenomenon of the 1990s.

Do prohibitions against insider trading affect the cost of equity in a country? As many other things affect the cost of equity in a country, the most important of which is the risk of the stock market, we can give a meaningful answer to our question only by controlling for the other determinants of the cost of equity. This is where we run into a serious problem. There seems to be no consensus in the literature on international finance as to what variable to use to measure risk.

The usual proxies for risk have been shown not to perform very well. Though Solnik (1974a,b) made a strong case for using the world market portfolio as the risk factor, he was soon disillusioned (see Solnik (1977)). Though Harvey and Zhou (1993) fail to reject the international CAPM, more general models that allow time-variations (like Harvey (1991)) or multi-factors and time-variations (like Ferson and Harvey (1993)) are rejected. Though a country's beta with respect to the world market portfolio has some merit to explain expected returns for developed countries, it is useless to explain expected returns for emerging markets; the variance of return of the country's stock market does better (see Harvey (1995)).

Given this lack of consensus in the literature on international finance as to what variable to use to measure risk, we adopt an agnostic approach in the paper. This is how we proceed. Our first set of tests examines the null hypothesis that the existence of insider trading laws do not affect the liquidity of a country's stock market. We then check whether enforcement of insider trading laws affects liquidity. Our results are the following. Both insider trading laws and their enforcement have a positive and significant effect on liquidity.

Our second set of tests examines the null hypothesis that the existence of insider trading laws do not affect the cost of equity in a country's stock market. We then check whether enforcement of insider trading laws affects the cost of equity in a country's stock market. These second set of tests progressively control for more and more variables.

The first round of these second set of tests do not control for anything. Our results are the following. Both insider trading laws and their enforcement have a negative and significant effect on the cost of equity.

The second round of these second set of tests implicitly control for other factors by using a forecasted dividend yield plus the growth rate in dividends as a proxy for the cost of equity. Our results are the following. Both insider trading laws and their enforcement have a negative and significant effect on the cost of equity.

The third round of these second set of tests explicitly control for other factors. To control for risk, we adopt a version of the Bekaert and Harvey (1995) model. This model allows for partial integration of a country to the world capital markets. Their 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 capital markets (where risk is measured by the country's beta with respect to the world market portfolio). As Stulz (1999) demonstrates, the gradual integration of a stock market into the world capital market affects the cost of equity, and models should account for that.

After removing the effect of the above risk factors, we investigate whether the residuals are affected

by the insider trading variables. Our results are the following. Enforcement of insider trading is found to significantly decrease the cost of equity. On the other hand, the mere existence of insider trading laws has no effect.

At this point we investigate whether our finding that the enforcement of insider trading laws significantly decrease the cost of equity is robust to the inclusion of other factors.

Dumas and Solnik (1995) show that foreign exchange rate risk is priced. So we investigate whether the significantly negative effect of the enforcement of insider trading laws remains on the above residuals after controlling for the foreign exchange rate factor. We find that the negative effect survives.

As our first set of tests showed that countries that enforce insider trading laws have more liquidity in their stock markets, and as Brennan and Subrahmanyam (1996) showed that a liquidity premium exists, it is possible that the above tests are just showing this. So we investigate whether the significantly negative effect of the enforcement of insider trading laws remains on the above residuals after controlling for the foreign exchange rate factor and the liquidity factor. We find that the negative effect survives.

As there has been some recent literature documenting that better legal institutions are associated with more efficient capital markets -- see, for example, La Porta et al (1996, 1997), Levine (1997), Demirguc-Kunt and Maksimovic (1998), and Lombardo and Pagano (1999) -- we need to control for these legal factors. So we investigate whether the significantly negative effect of the enforcement of insider trading laws remains on the above residuals after controlling for the foreign exchange rate factor, the liquidity factor and a variable measuring shareholder rights. We find that the negative effect survives.

Erb, Harvey and Viskanta (1996) found that country credit ratings are a very good proxy for the ex-ante risk exposure of, particularly, segmented emerging economies. Country credit ratings predict both expected returns and volatility. They argue that it might be better to use this risk measure that is not associated with the stock market. So in the third set of tests, we adopt this minimalist approach. This approach has another advantage: as there are many more countries for which we have data on ratings than

countries for which we have data on stock market returns, our sample size is roughly doubled from 51 to 97. We examine the null hypothesis that the existence of insider trading laws do not affect the credit rating of a country. We then check whether enforcement of insider trading laws affects the credit rating of country. Our results are the following. It is found that both insider trading laws and their enforcement lead to a significant increase in credit ratings.

To summarize, in the most general formulation of our empirical model, which is the model that controls for risk factors, a liquidity factor, and a variable that aggregates other shareholder rights, we find that cost of equity is reduced by roughly 5% on an annual basis if insider trading regulations are enforced. More importantly, we find that the mere existence of insider trading regulations without their enforcement does not affect the cost of equity.

The paper is structured as follows. In Section I we describe our data. Section II gives a descriptive statistics of our findings from our comprehensive survey of stock markets around the world. Section III, which is the main section of this paper, tests the null hypothesis that the existence and enforcement of insider trading laws does not affect the cost of raising equity in a country. We conclude in Section IV.

I. Data

We are interested in finding out whether the existence and enforcement of insider trading laws affect the cost of equity in a country. To this end, we collect primary and secondary data from different sources. The data could broadly be classified into three categories: the data on the existence and the enforcement of insider trading in various stock markets of the world, stock market returns, and other variables that may affect the cost of equity in a country.

A. *Data on the Existence and the Enforcement of Insider Trading Laws*

The first thing we did was to count the number of countries that had stock markets. Assuming that

every stock market had its own web site in this information age, we counted the number of web sites.[4] According to this criterion, there were 103 countries that had stock markets at the end of 1998, of which 23 are classified as developed markets, and 80 are classified as emerging markets. This list included all the 88 countries covered in the 1998 edition of the International Encyclopedia of the Stock Market, and it included all the 94 countries included in the 1998 edition of the Handbook of World Stock, Derivative and Commodity Exchanges. The 80 emerging markets we identify include all the 28 emerging markets that Morgan Stanley Capital International (MSCI) follows as well as the 32 that the International Financial Corporation (IFC) of the World Bank tracks. The first column in Table I gives a list of all the countries.

We then sent emails, letters and faxes to all the 103 stock markets, as well as to their national regulators.[5] The reason we sent letters to two sources is because we wanted to cross-check the information that was provided. We asked in our letter if the stock market had insider trading laws and, if yes, from when. If they had insider trading laws, we asked if there had been a prosecution under these laws – successful or unsuccessful – and, if yes, when was the first prosecution. The reason we asked the second question is because Bhattacharya et al (2000) had shown in the case of one emerging market that the existence of insider trading laws without their enforcement – as proxied by a prosecution – does not deter insiders. Wherever possible, and this was only possible for a small subset of developed countries, the answers were cross-checked against the findings of Posen (1991) and Stamp and Welsh (1996).

As we were acutely sensitive of the fact that responses were likely from countries that had enforced insider trading laws, which would lead to a severe selection bias in our results, we began our formal tests only after we had obtained information from *all* the 103 countries. This took about a year, and as many as

[4] The Yahoo website (http://dir.yahoo.com/Business_and_Economy/Finance_and_Investment/Exchanges/Stock_Exchanges) gives a comprehensive list of stock markets of the world. So does the web site of the International Federation of Stock Exchanges (http://www.fibv.com). The third source is a list compiled by Ken Loder of Seattle University (http://www2.jun.alaska.edu/~jfdja/common/markq.html) .

[5] The email and postal addresses of the stock markets, as well as their facsimile numbers, were obtained from their respective web sites. The email and postal addresses of the national regulators, as well as their facsimile numbers, were obtained from the membership list of the International Organization of Securities Commissions (IOSCO) (http://www.iosco.org/iosco.html). Some countries did not have national regulators.

5 reminders to certain stock markets. The second column in Table I tells us that this information was available for all 103 countries.

B. *Stock Market Returns*

Data on monthly equity indices were obtained from Morgan Stanley Capital International (MSCI). MSCI covers only 23 developed countries and 28 emerging markets. All our data extend to December 1998. For the developed countries the data begin on January 1969, but there are exceptions. For the emerging markets the data begin on January 1988, but there are exceptions. The third column in Table I gives us the sample period that was available for these 51 monthly stock market indices. These indices are value-weighted, and are calculated with dividend reimbursement. 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 market portfolio.[6]

We also obtained data on monthly equity indices of emerging markets from the International Financial Corporation (IFC) of the World Bank. They cover a slightly different set of emerging markets and their data begin from different dates for different markets.[7] The selection criteria for including stocks in the two indices are different.[8] This leads us to make a difficult choice. If we use the MSCI data for emerging markets, it has the advantage that we are consistent in our methodology of constructing indices for all countries, but it has the disadvantage that we do not have as much data for the emerging markets that the IFC

[6] The MSCI World Index is actually an index of only developed countries. It begins in December 1969. In principle, we should have used the MSCI All Country World Index, but since this begins only from December 1987 and has a correlation of 0.996767 with the developed country index, it is better to use the developed country index in practice. The results in this paper are with respect to this developed country index. We ran all our tests using the AC World Index as well. As all the results are similar, we do not report it in this paper.

[7] IFC covers 32 emerging markets. The data begins from January 1976 for Argentina, Brazil, Chile, Greece, India, Korea, Mexico, Thailand and Zimbabwe; it begins from January 1979 for Jordan; it begins from January 1985 for Colombia, Malaysia, Nigeria, Pakistan, Philippines, Taiwan and Venezuela; it begins from January 1986 for Portugal and Turkey; it begins from January 1990 for Indonesia; it begins from January 1993 for China, Hungary, Peru, Poland and South Africa; it begins from January 1994 for the Czech Republic, it begins from January 1996 for Egypt, Morocco, Russia and Slovakia; it begins from January 1997 for Israel; and it begins from January 1998 for Saudi Arabia.

[8] Although both MSCI and IFC try to represent 60 percent of total market capitalization, MSCI designs its indices to mirror the industrial composition of the local market, whereas IFC tends to choose the more liquid stocks.

database has. If, instead, we choose the IFC data for emerging markets, it has the disadvantage that we are inconsistent in our methodology of constructing indices across the two sub samples, but it has the advantage of more data for the emerging markets. Given that we find that insider trading laws were rarely enforced before the 1990s, which implies that the pre-1990 IFC data does not have much cross-sectional variation with respect to this crucial variable, we decided that the first choice was better. So we report all our results using only the MSCI database.[9]

Descriptive statistics about the stock markets for 1997 were obtained from the 1998 edition of the Handbook of World Stock, Derivative and Commodity Exchanges. We obtained the following information about 94 countries: the year of establishment, the number of firms listed at year-end 1997, the market capitalization in USD at year-end 1997, and the volume of trade in USD in 1997. Data on the missing 9 countries as well as cross-checks of the above data were obtained from the 103 stock market web sites.

C. Other variables that may affect the cost of equity in a country

Liquidity, as demonstrated by Brennan and Subrahmanyam (1996), may affect the cost of equity. The measure of liquidity that we adopted was turnover, and this is defined as the volume of trade in the stock market divided by the market capitalization of the stock market. We obtained monthly data on the volume of trade and market capitalization for the 51 countries (23 developed countries plus 28 emerging economies) from the vendor Datastream. The data begin in 1973. For some countries the data began later. The fourth and fifth column in Table I gives us the sample period that was available for these 51 monthly market capitalization and volume time-series.

A quick and dirty measure of the cost of equity is forecasted dividend yield plus growth rate in dividends. We obtained monthly data on the dividend yield for the 51 countries from the vendor Datastream. We multiplied market capitalization by the dividend yield to obtain the dividend level, and from this we

[9] We ran all our tests using the IFC database as well. As all the results are similar, we do not report it in this paper. The interested reader may obtain these results from the authors.

computed the dividend growth. The data begin in 1973. For some countries the data began later. The sixth column in Table I gives us the sample period that was available for these 51 monthly dividend yield time-series.

Bekaert and Harvey (1997) divide the sum of exports and imports with a country's gross domestic product to obtain a variable that proxies the level of integration of a country with the rest of the world. This is because the level of globalization does affect the cost of equity (see Stulz (1999)).

We use the same method. Monthly data on exports and imports for the 51 countries were obtained from the vendor Datastream, as were quarterly data on gross domestic product. We divided GDP by 3 to obtain monthly GDP. The data begin in 1969. For some countries the data began later, and for some countries the frequency of GDP was yearly. In the latter case, we divided by 12 to obtain monthly GDP. The seventh, eighth and ninth column in Table I gives us the sample period that was available for these 51 GDP, exports and imports time-series.

Dumas and Solnik (1995) show that foreign exchange rate risk is priced. Monthly data on foreign exchange rates is obtained from the vendor Datastream. The data begin in 1986. For some countries the data began later. The tenth column in Table I gives us the sample period that was available for these 51 monthly foreign exchange rate time-series.

The data on legal variables were obtained from La Porta et al (1996). We were specifically interested in a variable that measures shareholder rights. We constructed an index aggregating shareholder rights from their Table 2. The index is formed by adding 1 when: (1) there is one share-one vote rule; (2) the country allows shareholders to mail their proxy vote to the firm; (3) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (4) cumulative voting or proportional representation of minorities in the board of directors is allowed; (5) an oppressed minorities mechanism is in place; and (6) 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. The eleventh column in Table I gives us this computed index value for the 49 countries they track.

Erb, Harvey and Viskanta (1996) found that country credit ratings are a very good proxy for the ex-ante risk exposure of, particularly, segmented emerging economies. Country credit ratings come from Institutional Investor's semi-annual survey of bankers. The survey represents the responses of 75-100 bankers. Respondents rate each country on a scale of 0 to 100. They rate them once every six months. The data, with a few exceptions, begins on September 1979 and ends on September 1999. This data can be download from Harvey's web site (http://www.duke.edu/~charvey). The twelfth column in Table I gives us the sample period that was available for these 97 biannual country credit ratings time-series.

II. Stock Markets and Insider Trading Regulations Around the World

A. Stock Markets Around the World

Table II gives descriptive statistics of the main stock markets in the 103 countries that have stock markets. They exhibit a bewildering diversity.

The ages of the stock markets range from a few months (1998, Tanzania) to hundreds of years (1585, Germany), with the median year of establishment being 1953. As expected, stock markets in the developed countries (median year of establishment is 1845) are older than stock markets in the emerging markets (median year of establishment is 1974). The number of listed firms ranged from 2 (1997, Macedonia) to 5843 (1997, India), with the median number of listed firms being 128. As expected, stock markets in the developed countries (median number of listed firms is 237) list more firms than stock markets in the emerging economies (median number of listed firms is 84). Market capitalization of the stock markets ranged from 0.002 billion USD (1997, Guatemala) to 8879.631 billion USD (1997, New York Stock Exchange), with the median being 14.8 billion USD. As expected, the size of the stock markets in the developed countries (median size is 290.383 billion USD) is bigger than the size of the stock markets in the

emerging economies (median size is 3.67 billion USD). Volume of trade ranged from 0.0003 billion USD (1998, Tanzania) to 5777.6 billion USD (1997, New York Stock Exchange), with the median volume being 4.92 billion USD. As expected, there is more trade in the stock markets of the developed countries (median volume is 164.6 billion USD) than in the stock markets of the emerging economies (median volume is 0.639 billion USD). Turnover, which is defined as, volume divided by market capitalization, ranged from 0.00127 (1998, Tanzania) to 30.99 (1997, Ecuador), with the median being 0.338. As expected, the liquidity of the stock markets in the developed countries (median turnover is 0.547) is bigger than the liquidity of the stock markets in the emerging economies (median turnover is 0.246).

The next few columns in Table II gives us the performance of stock market returns in the 51 countries (23 developed and 28 emerging) that we have data from MSCI. As this data covers the last three decades for developed countries and only the last decade for emerging economies, comparisons between the two sub samples may be misleading. Two stylized facts, however, remain true: one, emerging markets (median annualized standard deviation of returns is 38%) have more volatile returns than developed countries (median annualized standard deviation of returns is 22%); and, two, there is a lot more variation in the performance amongst emerging economies (annualized arithmetic mean returns range from -18.2% to 28.1%) than there is in the performance amongst developed countries (annualized arithmetic mean returns range from 3.2% to 16.9%). This last fact is very helpful for our tests, because as we will see later, there is a lot more variation in existence and enforcement of insider trading laws amongst emerging economies than there is amongst developed countries.

B. The existence and enforcement of insider trading laws around the world

The last two columns in Table II give us information on the existence and enforcement of insider trading laws for every country that has a stock market. Insider trading laws were first established in the United States (1934). Till 1967, when France established these laws, the US was the only country that had insider trading laws. The latest country to establish insider trading laws is Cyprus (1999). The median year

of establishment of these laws is 1991. Developed countries (median year of establishment of insider trading laws is 1989) have had these laws in their books longer than emerging markets (median year of establishment of insider trading laws is 1992). Today, 100% of developed countries have insider trading laws on their books, but only 80% of emerging markets do. Before 1990, the respective numbers were 56.5% and 37.5%.

The enforcement of insider trading laws is difficult to measure. If we assume that a law is not enforced unless a charge is brought under it, a reasonable way to measure enforcement is to date the first prosecution, and assume that enforcement begins after that date. This is what we did. We found that the first case under federal insider trading laws took place in the United States (1961).[10] Till 1990, only 9 countries had brought any charges under these laws. The latest country to prosecute under insider trading laws is Oman. The median year of the first prosecution is 1994. Though the median year for the first prosecution was the same for both developed countries and emerging economies, 78.3% of developed countries have prosecuted till today, but only 24.1% of emerging markets have prosecuted till today. Before 1990, the respective numbers were 21.7% and 7%.

Figure 1 graphically demonstrates the history of the existence and the enforcement of insider trading laws in the twentieth century. It plots the time series of the number of countries with stock markets, the number of countries that have insider trading laws, and the number of countries that enforce their insider trading laws. It is apparent from this graph that in the first third of this century, these laws did not exist anywhere; in the second third of this century, these laws existed in only one country (the United States); and in the last third of this century, existence and enforcement of insider trading laws accelerated. This acceleration was particularly pronounced in the 1990s.

Figure 1 also tells us that if we use the argument of revealed preferences of governments around the

[10] In 1961,the Securities and Exchange Commission of the Unites States had an enforcement action against Cady, Roberts and Company. The case involved tipping: an insider (the tipper), who does not trade, discloses information to an outsider (the tippee), who trades. The classic insider trading case, which set precedents for the common law in the US, was Texas Gulf Sulpur (1968). See Bainbridge (1998) for a lucid description on the evolution of common law on insider trading in the United States.

world, it seems that a consensus has been achieved amongst governments: insider trading laws are good for society. So the debate about the pros and cons of insider trading laws seems to have been settled. Every developed country today has these insider trading laws, and four out of five emerging market economies have it.

The enforcement of these laws, however, is a different issue. Only one in three countries have enforced these laws. Why? We quote Stamp and Welsh here: "...In a number of common law jurisdictions.....the burden of proof on the prosecution is onerous, making it difficult to secure a conviction. In other jurisdictions, this problem is exacerbated by the legislatures' attempt to provide an exhaustive list ...which can be exploited by the experienced insider dealer. On the other hand, in a number of other countries, ...there is no political will to enforce the legislation."

Do the existence and the enforcement of insider trading laws in stock markets affect the cost of equity? We attempt to answer this question in the next section.

III. In Search of an Insider Trading Premium

We use two variables related to insider trading regulation. The first one is related to the existence of laws prohibiting insider trading in the country of interest ("IT laws"). The second variable relates to legal prosecution for insider trading in the country of interest ("IT enforcement"). These insider trading variables are coded as follows. The indicator variable "IT laws" changes from 0 to 1 in the year after the insider trading laws are instituted. The indicator variable "IT enforcement" changes from 0 to 1 in the year after the first prosecution is recorded.

A. Effect on liquidity

Does the existence of insider trading laws and their enforcement increase the willingness of investors to trade in financial markets? We can answer this question by examining the effect of our two insider trading variables on a measure of market liquidity. We use the natural logarithm of the ratio of volume to market

capitalization as a measure of liquidity. Call this variable "liq". We then run simple pooled regressions of our measure of liquidity on our insider trading variables. The regressions use data from our 51 countries from December 1969 to December 1998 (some countries do not have data for the full time period).

Table III presents the results from this pooled regression. When "IT laws" is the independent variable and "liq" is the dependent variable, Panel A tells us that the coefficient on "IT laws" is positive and statistically significant at the 5% level. When "IT enforcement" is the independent variable and "liq" is the dependent variable, Panel B tells us that the coefficient on "IT enforcement" is positive and statistically significant at the 5% level. These results provide evidence in favor of a testable implication drawn from the theoretical model of Bhattacharya and Spiegel (1991): insider trading laws and their enforcement improve liquidity in a market. Judging by p-values, the effect of enforcement of insider trading laws on liquidity seems to be stronger than the effect of their mere existence.

B. Effect on cost of equity

B.1. Unadjusted cost of equity

The proxy we use for cost of equity (the expected rate of equity return) is the realized rate of equity return. We call this variable "rawret". We then run simple pooled regressions of our measure of the cost of equity on our insider trading variables. The regressions use data from our 51 countries from December 1969 to December 1998 (some countries do not have data for the full time period).

Table IV presents the results from this pooled regression. When "IT laws" is the independent variable and "rawret" is the dependent variable, Panel A tells us that the coefficient on "IT laws" is negative and statistically significant at the 10% level. When "IT enforcement" is the independent variable and "rawret" is the dependent variable, Panel B tells us that the coefficient on "IT enforcement" is negative and statistically significant at the 6% level.

B.2. Implicitly-adjusted cost of equity

The second proxy for cost of capital is computed as the sum of the forecast of the dividend yield and

the growth rate of the dividend yield. This is a quick and dirty method to compute the cost of capital by backing it out from the classical constant growth dividend discount model. As risk affects the price, which is the denominator in the dividend yield, this method implicitly accounts for risk. We call this variable "div". We then run simple pooled regressions of our measure of the cost of equity on our insider trading variables. The regressions use data from our 51 countries from December 1969 to December 1998 (some countries do not have data for the full time period).

Table V presents the results from this pooled regression. When "IT laws" is the independent variable and "div" is the dependent variable, Panel A tells us that the coefficient on "IT laws" is negative and statistically significant at the 5% level. When "IT enforcement" is the independent variable and "div" is the dependent variable, Panel B tells us that the coefficient on "IT enforcement" is negative and statistically significant at the 2% level.

B.3. Explicitly-adjusted cost of equity

The major determining feature of the cost of equity is risk. We, therefore, need to control for risk in order to measure the marginal impact of insider trading laws. As there is no consensus in the international finance literature as to how to measure risk, we approach this problem by first discussing what elements we must include in our model.

The first thing we need to include is conditional covariances and conditional variances instead of unconditional covariances and unconditional variances. This is because Ferson and Harvey (1993) make a point that conditional betas explain some risk-premium in developed capital markets. We obtain conditional covariances and conditional variances from a multivariate ARCH model. This model was first introduced by Bollerslev, Engle and Wooldrige (1988). The specification we use can be written as follows:

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

where

$r_{i,t}$ is the monthly return of the stock market index of country i at time t,

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

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

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

$h_{i,t}$ is the conditional variance of the monthly return of the stock market index of country i at time t,

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

$h_{i,w,t}$ is the conditional covariance of the return of the stock market index with the return of the world at time t.

As in Engle, Lilien, and Robin (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 the above model.

The second thing we need to include is time-varying market integration. Stulz (1999) provided a theoretical argument to show that in a perfectly integrated world, the relevant measure for risk of a country's returns is the covariance between this country's returns and the world market portfolio's returns, whereas, in a perfectly segmented world, the relevant measure of risk is the volatility of the country's returns. In reality, national financial markets are not completely integrated, nor completely segmented. Moreover, the degree of integration/segmentation is not likely to be fixed over time. The model we use is very similar to the one presented by Bekaert and Harvey (1995). We simplify their model by assuming that the size of the trade sector -- imports plus exports divided by gross domestic product -- is the only instrument for market integration. This variable is used in a logistic function, which assigns time-varying weights to world versus local risk factors. Bekeart and Harvey (1997) find that increases in this ratio are associated with increased importance of world relative to local risk factors.

The model we use can be expressed as follows:

$$\left(r_{i,t} - r_{f,t}\right) = \alpha_0 + \phi_{i,t}\lambda_{cov}\,\mathrm{cov}_t\left[r_{i,t}, r_{w,t}\right] + \left(1-\phi_{i,t}\right)\lambda_{var}\,\mathrm{var}_t\left[r_{i,t}\right] + e_{i,t} \tag{2}$$

where

$$\phi_{i,t} = \frac{\exp\left(\alpha_1\left(\frac{\mathrm{exports}_t + \mathrm{imports}_t}{\mathrm{gdp}_t}\right)\right)}{1+\exp\left(\alpha_1\left(\frac{\mathrm{exports}_t + \mathrm{imports}_t}{\mathrm{gdp}_t}\right)\right)} \tag{3}$$

and $r_{f,t}$ is the monthly return of the 3 month US T-Bill at time t.

Here λ_{cov} is the price of the covariance risk with the world, and λ_{var} is the price of own country variance risk. These have to be estimated. The conditional covariances and variances, $\mathrm{Cov}_t\,[r_{i,t}, r_{w,t}]$ and

$Var_t[r_{i,t}]$ respectively, are obtained from the multivariate ARCH model described above. $\phi_{i,t}$ measures the level of integration of country i at time t. The definition of $\phi_{i,t}$ implies that it is a ratio of the sum of exports and imports to gross domestic product. It is designed to take values between zero and one. It determines the exposure of the countries equity to global risk (covariance) versus local risk (variance). The model is estimated using non-linear least squares. The results are given in Panel A of Table VI.

Panel A in Table VI tells us that λ_{cov} is statistically insignificant, implying that the covariance risk is not priced. Panel A in Table VI also tells us that λ_{var} is positive and statistically significant, implying that own country variance risk is priced.

B.3.1 Adjusting for risk

If the insider trading variables have no incremental effect on the cost of equity, then those variables will be orthogonal to the residuals from the model in (2). We therefore test the hypothesis that the insider trading variables do not affect the cost of equity by regressing the residuals from model (2) on the insider trading variables [11]. The results from this test is given in Panel B of Table VI.

Panel B in Table VI tells us that the coefficient on "IT laws" is statistically insignificant. On the other hand, Panel B in Table VI tells us that the "IT enforcement" dummy has a negative effect on the cost of equity. It is significant at the 8% significance level.

We conclude, therefore, that the mere existence of insider trading laws do not affect the cost of equity. The enforcement of insider trading laws, on the other hand, reduces the cost of equity.

At this point we investigate whether our finding -- the enforcement of insider trading laws significantly decreases the cost of equity – is robust to the inclusion of other factors.

B.3.2 Adjusting for risk and a foreign exchange factor

---

[11] We do not include the insider trading variables in the model in (2) directly for the following reason. The insider trading variables are dummy variables that take on the value of zero or one. Including a dummy variable in a non-linear estimation is subject to computational problems as the convergence of the optimization becomes more difficult and the results more unstable. This is especially the case for our model, which is large and complex. In any case, it should be noted that the two approaches are similar and should yield the same outcome for the test.

Dumas and Solnik (1995) show that foreign exchange rate risk is priced. So we investigate whether the significantly negative effect of the enforcement of insider trading laws remains on the above residuals after controlling for the foreign exchange rate factor.

The foreign exchange factor that we use is the conditional covariance of the return of the stock market index of the country with the return a US investor would get if she held the foreign currency. Denote this covariance as $Cov_t [r_{i,t}, r_{ifx,t}]$. This conditional covariance is obtained by using the multi variate ARCH model we previously discussed.– just replace the world portfolio (w) by the foreign exchange portfolio (ifx)

Panel B1 of Table VII is just panel B of Table VI, which were the results that were obtained if we regress the residuals from model (2) against only the insider trading enforcement variable. We now regress the residuals from model (2) against the insider trading enforcement variable as well as the above foreign exchange factor. Panel B2 of Table VII tells us that the coefficient on the insider trading enforcement variable factor continues to remain negative and significant at the 5% level.

B.3.3 Adjusting for risk, a foreign exchange factor, and a liquidity factor

Brennan and Subrahmanyam (1996) showed that a liquidity premium exists. Investors require a premium to compensate them for holding relatively illiquid assets. As our first set of tests showed that countries that enforce insider trading laws have more liquidity in their stock markets, it is possible that enforcement of insider trading laws is reducing the equity premium because the liquidity premium is being reduced. We need to control for this.

The liquidity variable is constructed as the natural logarithm of the ratio of volume to market capitalization. We regress the residuals from model (2) against the insider trading enforcement variable, the foreign exchange factor, and the liquidity factor. Panel B3 of Table VII tells us that the coefficient on the insider trading enforcement variable factor continues to remain negative and significant at the 10% level.

B.3.4 Adjusting for risk, a foreign exchange factor, a liquidity factor, and shareholder rights

As there has been some recent literature documenting that better legal institutions are associated with

more efficient capital markets -- see, for example, La Porta et al (1996, 1997), Levine (1997), Demirguc-Kunt and Maksimovic (1998), and Lombardo and Pagano (1999) -- we need to control for these other legal factors.[12]

We computed an index measuring shareholder rights by adding 1 when: (1) there is one share-one vote; (2) the country allows shareholders to mail their proxy vote to the firm; (3) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (4) cumulative voting or proportional representation of minorities in the board of directors is allowed; (5) an oppressed minorities mechanism is in place; and (6) 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. This data is obtained from Table 2 in La Porta et al (1996).

We regress the residuals from model (2) against the insider trading enforcement variable, the foreign exchange factor, the liquidity factor, and this index measuring shareholder rights. Panel B4 of Table VII tells us that the coefficient on the insider trading enforcement variable factor continues to remain negative and significant at the 6% level. It is interesting to note that in this most generalized test of our model, the other variables seem to have no explanatory power. Though we would not like to overemphasize this finding, it seems that, other than own country variance, the enforcement of insider trading laws is the most important determinant of the cost of equity in a country's stock market.

If we annualize the coefficient on the insider trading enforcement variable factor (-.00461), we find that the enforcement of insider trading reduces cost of equity by about 5% per year. This might appear to be unrealistically large. However, we need to keep in mind that the majority of the countries in our sample are emerging markets, and these have yearly returns ranging from -18.2% to 28.1%. With this respect, our estimate of the impact of enforcing insider trading laws on the cost of equity does not seem extreme.

[12] Lombardo and Pagano (1999) show that these legal variables are correlated with the return on equity.

C. Effect on Country Rating

Erb, Harvey and Viskanta (1996) found that country credit ratings are a very good proxy for the ex-ante risk exposure of, particularly, segmented emerging economies. Country credit ratings predict both expected returns and volatility. They argue that it might be better to use this risk measure that is not associated with the stock market. So in the third set of tests, we adopt this minimalist approach. This approach has another advantage: as there are many more countries for which we have data on ratings than countries for which we have data on stock market returns, our sample size is roughly doubled from 51 to 97. We call this country credit rating variable as "cr".

We examine the null hypothesis that the existence of insider trading laws do not affect the cost of equity of a country as proxied by its credit rating. We then check whether enforcement of insider trading laws makes any difference. Table VIII presents the results from this pooled regression. When "IT laws" is the independent variable and "cr" is the dependent variable, Panel A tells us that the coefficient on "IT laws" is positive and statistically significant at the 5% level. When "IT enforcement" is the independent variable and "cr" is the dependent variable, Panel B tells us that the coefficient on "IT enforcement" is positive and statistically significant at the 5% level. So both existence and enforcement of insider trading laws are significantly positively correlated with a country's credit rating.

Panel B of Table VIII tells us that the enforcement of insider trading laws increases a country's credit rating by 27 points. According to the estimated logarithmic empirical model of Erb, Harvey and Viskanta (1996) [13], a jump of a country's credit rating from 70 to 100 decreases its annualized cost of capital by about 7%, and a jump of a country's credit rating from 60 to 90 decreases its annualized cost of capital by about 8%. Given these numbers, our finding in Table VII that annualized cost of capital decreases by 5% if insider trading laws are enforced looks reasonable.

[13] The estimated logarithmic model of Erb, Harvey and Viskanta (1996) is Bi-annual Cost of Capital = 52.32% - 10.14% (ln of country credit rating).

IV. Concluding Remarks

Though the debate about the pros and cons of allowing insider trading in stock markets has been quite contentious in the law, economics and finance literature, it seems that from the point of view of actual practice, the debate seems to have been settled. In a comprehensive survey of insider trading regulations in every country that had a stock market at the end of 1998, this paper finds that 100% of the 23 developed countries, and about 80% of the 80 emerging markets, had insider trading laws in their books.

The enforcement of these laws, however, has been spotty. We find that there has been a prosecution in only one out of three countries. Developed countries have a better record than emerging markets (78.3% of developed countries, and 23.1% of emerging markets have had prosecutions).

The paper then goes on to show that the easy part – the establishment of insider trading laws – does not seem to reduce the cost of equity. It is the difficult part – the enforcement of insider trading laws – that actually reduces the cost of equity in a country. As a matter of fact, controlling for risk factors, a liquidity factor, and other possible legal determinants of the cost of equity, the paper finds that the enforcement of insider trading laws reduces the cost of equity by 5%.

Lombardo and Pagano (1999) argue that in an imperfectly integrated world, the supply of funds is upward sloping rather than perfectly horizontal. As legal variables affect both the supply as well as the demand for funds, the relationship between legal variables and the cost of funds could go either way. In particular, the improvement of the legal system in a country may increase the firm's demand for funds and thus increase its equilibrium price, or it may increase the supply of funds by households and thus decrease its equilibrium price. In their paper, they find that the relationship between legal variables and the cost of equity is mostly positive, and they correctly interpret this to mean that the demand side is affected more than the supply side.

In our paper, we find the relationship between cost of equity and the enforcement of insider trading laws to be negative. This means that the supply side is more affected than the demand side. This is to be

expected because theory suggests that less adverse selection would encourage investors to demand a lower insider trading premium, but should not per se encourage firms to supply more equity.

We leave future research to check the robustness of our results. First, once we have more stock market return data of many more countries, it can be checked whether our results still remain valid. Second, we need to use different models to measure risk. The literature on measuring risk in international markets is a growing field, and the particular model of Bekaert and Harvey (1995) that we have employed in this paper is just one of many worthwhile candidates.

References

Agrawal, A. and J. Jaffe, 1995, Does section 16b deter insider trading by target managers?, *Journal of Financial Economics* 39, 295-319.

Allen, F. and D. Gale, 1992, Stock-price manipulation, *Review of Financial Studies* 5, 503-529.

Ausubel, L., 1990, Insider trading in a rational expectations economy, *American Economic Review* 80, 1022-1041.

Back K., 1992, Insider trading in continuous time, *Review of Financial Studies* 5, 387-409.

Bagnoli, M. and N. Khanna, 1992, Insider trading in financial signaling models, *Journal of Finance* 47, 1905-1934.

Bainbridge, S., 1998, Insider trading: an overview, *Encyclopedia of Law and Economics*, forthcoming.

Bebchuk, L. and C. Fershtman, 1994, Insider trading and the managerial choice among risky projects, *Journal of Financial and Quantitative Analysis* 29, 1-14.

Bekaert, G. and C. Harvey, 1997, Emerging equity market volatility, *Journal of Financial Economics* 43, 29-77.

Bekaert, G. and C. Harvey, 1995, Time varying world market integration, *Journal of Finance* 50, 403-444.

Bernhardt, D., B. Hollifield and E. Hughson, 1995, Investment and insider trading, *Review of Financial Studies* 8, 501-543.

Bhattacharya, U., H. Daouk, B. Jorgenson and C. Kehr, 2000, When an Event is Not an Event: the Curious Case of an Emerging Market, *Journal of Financial Economics* 55.

Bhattacharya, U. and M. Spiegel, 1991, Insiders, outsiders, and market breakdowns, *Review of Financial Studies* 4, 255-282.

Biais, B. and P. Hillion, 1994, Insider and liquidity trading in stock and options markets, *Review of Financial*

Studies 7, 743-780.

Bollerslev, T., R. Engle and J. Wooldrige, 1988, A capital asset pricing model with time-varying covariances, *Journal of Political Economy* 96, 116-131.

Brennan, M. and A. Subrahmanyam, 1996, Market microstructure and asset pricing: on the compensation for illiquidity in stock returns, *Journal of Financial Economics* 41, 441-464.

Cornell, B. and E. Sirri, 1992, The reaction of investors and stock prices to insider trading, *Journal of Finance* 47, 1031-1059.

Damodaran, A. and C. Liu, 1993, Insider trading as a signal of private information, *Review of Financial Studies* 6, 79-119.

Demarzo, P., M. Fishman and K. Hagerty, 1998, The optimal enforcement of insider trading regulations, *Journal of Political Economy* 106, 602-632.

Demsetz, H., 1986, Corporate control, insider trading and rates of return, *American Economic Review* 76, Papers and Proceedings, 313-316

Demirguc-Kunt, A. and V. Maksimovic, 1998, Law, Finance, and Firm Growth, *Journal of Finance* 53, 2107-2137.

Dumas, B. and B. Solnik, 1995, The World Price of Foreign Exchange Risk, *Journal of Finance* 50, 445-479.

Dutta, P. and A. Madhavan, 1995, Price continuity rules and insider trading, *Journal of Financial and Quantitative Analysis* 30, 199-221.

Dye, R., 1984, Insider trading and incentives, *Journal of Business* 57, 295-313.

Engle, R., D. Lilien and R. Robins, 1987, Estimating time varying risk premia in the term structure: The ARCH-M model, *Econometrica* 55, 391-407.

Erb, C., C. Harvey and T. Viskanta, 1996, Expected returns and volatility in 135 countries, *Journal of*

Portfolio Management, Spring 1996, 46-58.

Ferson, W. and C. Harvey, 1993, The risk and predictability of international equity returns, *Review of Financial Studies* 6, 527-566.

Finnerty, J., 1976, Insiders and market efficiency, *Journal of Finance* 31, 1141-1148.

Fishman, M. and K. Hagerty, 1992, Insider trading and the efficiency of stock prices, *Rand Journal of Economics* 23, 106-122.

Handbook of World Stock, Derivative and Commodity Exchanges, 1998, International Financial Publications, London.

Harvey, C., 1991, The world price of covariance risk, *Journal of Finance* 46, 111-157.

Harvey, C. and G. Zhou, 1993, International asset pricing with alternative distribution assumptions, *Journal of Empirical Finance* 1, 107-131.

Harvey, C., 1995, Predictable risk and returns in emerging markets, *Review of Financial Studies* 8, 773-816.

Givoly D. and D. Palmon, 1985, Insider trading and the exploitation of inside information: some empirical evidence, *Journal of Business* 58, 69-87.

Glosten, L., 1989, Insider trading, liquidity, and the role of the monopolist specialist, *Journal of Business* 62, 211-235.

Grossman, S., 1986, An analysis of the role of insider trading on futures markets, *Journal of Business* 59, 129-146

Heinkel, R. and A. Kraus, 1987, The effect of insider trading on average rates of return, *Canadian Journal of Economics* 20, 588-611.

Hirshleifer, J., 1971, The private and social value of information and the reward to incentive activity, *American Economic Review* 61, 561-574.

Jarrell, G. and A. Poulsen, 1989, Stock trading before the announcement of tender offers: insider trading or market anticipation, *Journal of Law, Economics and Organization* 5, 225-248.

John, K. and R. Narayanan, 1997, Market manipulation and the role of insider trading regulations, *Journal of Business* 70, 1997.

Khanna, N., S. Slezak and M. Bradley, 1994, Insider trading, outside search, and resource allocation: why firms and society may disagree on insider trading restrictions, *Review of Financial Studies* 7, 575-608.

Kyle, A., 1985, Continuous auctions and insider trading, *Econometrica* 53, 1315-1335.

Laffont, J. and E. Maskin, 1990, The efficient market hypothesis and insider trading on the stock market, *Journal of Political Economy* 98, 70-93.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny, 1996, Law and Finance, *Journal of Political Economy*, forthcoming.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny, 1997, Legal Determinants of External Finance, *Journal of Finance* 52, 1131-1150.

Leland, H., 1992, Insider trading: should it be prohibited?, *Journal of Political Economy* 100, 859-887.

Levine, R., 1997, Financial Development and Economic Growth: Views and Agenda, *Journal of Economic Literature* 35, 688-726.

Lin, J. and J. Howe, 1990, Insider trading in the OTC market, *Journal of Finance* 45, 1273-1284.

Lombardo, D. and M. Pagano, 1999, Legal Determinants of the Return on Equity, CEPR working paper, London.

Manne, H., 1966, *Insider Trading and the Stock Market*, Free Press.

Manove, M., 1989, The harm from insider trading and informed speculation, *Quarterly Journal of Economics* 104, 823-845.

Maug, E., 1999, Insider trading legislation and corporate governance, working paper, Duke University.

Meulbroek, L., 1992. An Empirical analysis of illegal insider trading. *Journal of Finance* 47, 1661-1699.

Newey, W. and K. West, 1987, A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703-708.

Penman, S., 1985, A comparison of the information content of insider trading and management earnings forecasts, *Journal of Financial and Quantitative Analysis* 20, 1-17.

Posen, N., 1991, *International Securities Regulation*, Little, Brown and Company, Boston, USA.

Rochet, J. and J. Vila, 1994, Insider trading without normality, *Review of Economic Studies* 61, 131-152.

Rozeff, M. and M. Zaman, 1988, Market efficiency and insider trading: New evidence, *Journal of Business* 61, 25-44.

Seyhun, H., 1986, Insiders, profits, costs of trading, and market efficiency, *Journal of Financial Economics* 16, 189-212.

Seyhun, H., 1992, The effectiveness of the insider trading sanctions, *Journal of Law and Economics* 35, 149-182.

Sheimo. M. (eds), 1008, *International Encyclopedia of the Stock Market (Vol 1 and 2)*, Fitzroy Dearborn Publishers, Chicago, USA.

Shin, J., 1996, The optimal regulation of insider trading, *Journal of Financial Intermediation* 5, 49-73.

Solnik, B, 1974a, An equilibrium model of the international capital market, *Journal of Economic Theory* 8, 500-524.

Solnik, B, 1974b, The international pricing of risk: an empirical investigation of the world capital market structure, *Journal of Finance* 29, 48-54.

Solnik, B, 1977, Testing international asset pricing: some pessimistic views, *Journal of Finance* 32, 503-511.

Stamp M. and C. Welsh (eds), 1996, *International Insider Dealing*, FT Law and Tax, Biddles Limited,

Guildford, UK.

Stulz, R., 1999, Globalization of equity markets and the cost of capital, working paper, National Bureau of Economic Research.

Table I
Description of Data Used

Country	Information on IT Laws	Indices of Stock Markets (Monthly) (Sample Period)	Market Capitalization of Main Exchange (Monthly) (Sample Period)	Volume in Main Exchange (Monthly) (Sample Period)	Dividend Yield (Monthly) (Sample period)	GDP of Country (Quarterly/Annual) (Sample period)	Exports of Country (Monthly) (Sample Period)	Imports of Country (Monthly) (Sample Period)	Exchange Rate (Monthly) (Sample Period)	Index of Shareholder Rights	Country Credit Rating (Bi Annual) (Sample Period)
Developed Countries											
Australia	Available	12/69-12/98	1/73-12/98	1/84-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
Austria	Available	12/69-12/98	1/73-12/98	8/86-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Belgium	Available	12/69-12/98	1/73-12/98	1/86-12/98	1/73-12/98	69Y-98Y	1/93-12/98	1/93-12/98	1/86-12/98	0	9/79-9/98
Canada	Available	12/69-12/98	1/73-12/98	1/73-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
Denmark	Available	12/69-12/98	1/73-12/98	4/88-12/98	1/73-12/98	87Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	3	9/79-9/98
Finland	Available	12/87-12/98	3/88-12/98	NA	3/88-12/98	70Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
France	Available	12/69-12/98	1/73-12/98	6/88-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	10/86-12/98	2	9/79-9/98
Germany	Available	12/69-12/98	1/73-12/98	6/88-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	1	9/79-9/98
Hong Kong	Available	12/69-12/98	1/73-12/98	6/88-12/98	1/73-12/98	73Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	5	9/79-9/98
Ireland	Available	12/87-12/98	1/73-12/98	NA	1/73-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	3	9/79-9/98
Italy	Available	12/69-12/98	1/73-12/98	7/86-12/98	1/73-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/75-12/98	0	9/79-9/98
Japan	Available	12/69-12/98	1/73-12/98	1/90-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
Luxembourg	Available	12/87-12/98	1/73-12/98	NA	NA	69Y-98Y	1/71-12/98	1/71-12/98	12/93-12/98	NA	9/91-9/98
Netherlands	Available	12/69-12/98	1/73-12/98	2/86-12/98	1/73-12/98	77Q1-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
New Zealand	Available	12/87-12/98	1/88-12/98	1/90-12/98	1/88-12/98	88Q3-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
Norway	Available	12/69-12/98	1/80-12/98	1/80-12/98	1/80-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	12/80-12/98	3	9/79-9/98
Portugal	Available	12/87-12/98	1/90-12/98	1/90-12/98	1/90-12/98	77Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Singapore	Available	12/69-12/98	1/73-12/98	1/83-12/98	1/73-12/98	69Y-98Y	12/69-12/98	12/69-12/98	12/84-12/98	4	9/79-9/98
Spain	Available	12/69-12/98	3/87-12/98	2/90-12/98	3/87-12/98	70Q1-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Sweden	Available	12/69-12/98	1/82-12/98	1/82-12/98	1/82-12/98	80Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Switzerland	Available	12/69-12/98	1/73-12/98	1/89-12/98	1/73-12/98	70Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	1	9/79-9/98
United Kingdom	Available	12/69-12/98	1/70-12/98	10/86-12/98	1/70-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
United States	Available	12/69-12/98	1/73-12/98	1/73-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98		5	9/79-9/98
Emerging Markets											
Argentina	Available	12/87-12/98	1/88-12/98	8/93-12/98	8/93-12/98	69Q4-98Q4	12/69-12/98	12-69-12/98	3/88-12/98	4	9/79-9/98
Armenia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bahrain	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Bangladesh	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/82-9/98
Barbados	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/84-9/98
Bermuda	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bolivia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Botswana	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Brazil	Available	12/87-12/98	7/94-12/98	NA	7/94-12/98	76Y-98Y	12/69-12/98	12/69-12/98	1/90-12/98	4	9/79-9/98
Bulgaria	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/80-9/98
Chile	Available	12/87-12/98	7/89-12/98	7/89-12/98	7/89-12/98	73Y-98Y	12/69-12/98	12/69-12/98	1/93-12/98	4	9/79-9/98
China	Available	12/92-12/98	8/91-12/98	8/91-12/98	3/94-12/98	79Y-98Y	1/81-12/98	1/81-12/98	1/93-12/98	NA	9/79-9/98
Colombia	Available	12/92-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	1	9/79-9/98
Costa Rica	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Croatia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Cyprus	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Czech Republic	Available	12/94-12/98	NA	NA	NA	93Y-98Y	1/93-12/98	1/93-12/98	12/94-12/98	NA	3/93-9/98
Ecuador	Available	NA	NA	NA	NA	NA	NA	NA	NA	2	9/79-9/98
Egypt	Available	12/94-12/98	NA	NA	NA	69Y-98Y	8/90-12/98	8/90-12/98	12/94-12/98	2	9/79-9/98
El Salvador	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/81-9/98
Estonia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/92-9/98
Ghana	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Greece	Available	12/87-12/98	1/88-12/98	1/88-12/98	1/90-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Guatemala	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/81-9/98
Honduras	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/81-9/98
Hungary	Available	12/94-12/98	NA	NA	NA	70Y-98Y	1/76-12/98	1/76-12/98	12/91-12/98	NA	9/79-9/98
Iceland	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
India	Available	12/92-12/98	1/90-12/98	1/95-12/98	1/90-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Indonesia	Available	12/87-12/98	4/90-12/98	4/90-12/95	4/90-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	2	9/79-9/98
Iran	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Israel	Available	12/92-12/98	NA	NA	NA	71Q1-98Q4	12/69-12/98	12/69/12/98	1/86-12/98	3	9/79-9/98
Jamaica	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Jordan	Available	12/87-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	1	9/79-9/98
Kazakhstan	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Kenya	Available	NA	NA	NA	NA	NA	NA	NA	NA	3	9/79-9/98
Kuwait	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Latvia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/92-9/98
Lebanon	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Lithuania	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/92-9/98
Macedonia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malawi	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/81-9/98
Malaysia	Available	12/87-12/98	1/86-12/98	1/86-12/98	1/86-12/98	69Y-98Y	12/69-12/98	12/69-12/98	8/97-12/98	3	9/79-9/98
Malta	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/94-9/98
Mauritius	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/81-9/98
Mexico	Available	12/87-12/98	1/88-12/98	1/88-12/98	5/89-12/98	81Q1-98Q4	12/69-12/98	12/69-12/98	1/92-12/98	0	9/79-9/98
Moldova	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mongolia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Morocco	Available	12/94-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98	12/94-12/98	NA	9/79-9/98
Namibia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/92-9/98
Nigeria	Available	NA	NA	NA	NA	NA	NA	NA	NA	3	9/79-9/98
Oman	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Pakistan	Available	12/92-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98		5	9/79-9/98
Palestine	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Panama	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Paraguay	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Peru	Available	12/92-12/98	NA	NA	NA	79Q1-98Q4	12/69-12/98	12/69-12/98	6/91-12/98	3	9/79-9/98
Philippines	Available	12/87-12/98	9/87-12/98	1/90-12/98	11/88-12/98	80Q4-98Q4	12/69-12/98	12/69-12/98	1/86/12/98	4	9/79-9/98
Poland	Available	12/92-12/98	3/94-12/98	3/94-12/98	3/94-12/98	79Y-98Y	1/86-12/98	1/86-12/98	12/91-12/98	NA	9/79-9/98
Romania	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Russia	Available	12/94-12/98	NA	NA	NA	93Q3-98Q4	1/92-12/98	1/92-12/98	7/93-12/98	NA	9/92-9/98
Saudi Arabia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Slovakia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	3/93-9/98
Slovenia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
South Africa	Available	12/92-12/98	1/73-12/98	1/90-12/98	1/73-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	1/86-12/98	4	9/79-9/98
South Korea	Available	12/87-12/98	9/87-12/98	9/87-12/98	9/87-12/98	69Q4-98Q4	12/69-12/98	12/69-12/98	12/92-12/98	3	9/79-9/98
Sri Lanka	Available	12/92-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98	12/93-12/98	2	9/82-9/98
Swaziland	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/88-9/98
Taiwan	Available	12/87-12/98	9/87-12/98	4/91-12/98	5/88-12/98	69Q4-98Q4	1/88-12/98	1/88-12/98	12/93-12/98	3	9/79-9/98
Tanzania	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Thailand	Available	12/87-12/98	1/87-12/98	1/87-12/98	1/87-12/98	69Y-98Y	12/69-12/98	12/69-12/98	1/86-12/98	3	9/79-9/98
Trinidad and Tobago	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Tunisia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Turkey	Available	12/87-12/98	1/88-12/98	1/88-12/98	6/89-12/98	87Q1-98Q4	12/69-12/98	12/69-12/98	2/86-12/98	2	9/79-9/98
Ukraine	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Uruguay	Available	NA	NA	NA	NA	NA	NA	NA	NA	2	9/79-9/98
Uzbekistan	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/92-9/98
Venezuela	Available	12/92-12/98	NA	NA	NA	69Y-98Y	12/69-12/98	12/69-12/98	12/93-12/98	1	9/79-9/98
Yugoslavia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Zambia	Available	NA	NA	NA	NA	NA	NA	NA	NA	NA	9/79-9/98
Zimbabwe	Available	NA	NA	NA	NA	NA	NA	NA	NA	3	9/79-9/98

Notes:

(1) Stock markets of 103 countries had web sites. We assumed this to be the universe of all countries that had stock markets. The list is given in Column 1.
(2) We sent letters to the regulators and the stock markets in the 103 countries that had stock markets, asking them about their insider trading laws. Column 2 tells us that we received information from all of them.
(3) Data on monthly stock market indices were obtained from Morgan Stanley Capital Market International (MSCI). They were available for 23 developed countries and for 28 emerging markets. The sample periods are given in Column 3.
(4) Data on monthly market capitalization and volume were obtained from Datastream. The sample periods are given in Columns 4 and 5.
(5) Data on monthly dividend yields were obtained from Datastream. The sample periods are given in Column 6.
(6) Data on quarterly/annual GDP and monthly exports and imports were obtained from Datastream. The sample periods are given in Columns 7, 8 and 9.
(7) Data on monthly foreign exchange rates were obtained from Datastream. The sample periods are given in Column 10.
(8) Data on the index measuring shareholder rights is obtained by adding 1 when: (1) there is one share-one vote rule; (2) the country allows shareholders to mail their proxy vote to the firm; (3) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (4) cumulative voting or proportional representation of minorities in the board of directors is allowed; (5) an oppressed minorities mechanism is in place; and (6) 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. This data is obtained from Table 2 in La Porta et al (1996). Column 11 gives us this computed index.
(9) Data on bi-annual country credit ratings is obtained from the website of Harvey (http://www.duke.edu/~charvey). The sample periods are given in Column 12.

Table II
Stock Markets and Insider Trading Regulations Around the World

Country	Establishment of Main Exchange	Company Listings in Main Exchange (end-1997)	Market Capitalization of Main Exchange ($ bil in end-1997)	Volume in Main Exchange ($ bil in 1997)	Turnover in Main Exchange	Arithmetic Mean of Stock Market Return (Annualized)	Standard Deviation of Stock Market Return (Annualized)	IT Laws Existence	First Enforcement
Developed Countries									
Australia	1859	1216	295	150	0.508474576	8.16%	26.3%	1991	1996
Austria	1771	109	37.3	12.412	0.332761394	10.1%	20.8%	1993	No
Belgium	1801	141	138.9	28.9	0.208063355	15.6%	18.4%	1990	1994
Canada	1878	1420	568	304	0.535211268	9.1%	19.1%	1966	1976
Denmark	1919	237	93.76	37.4	0.398890785	13.2%	18.6%	1991	1996
Finland	1912	127	73.3	34.55	0.471350614	15.2%	28.0%	1989	1993
France	1826	717	676.3	394.9	0.583912465	12.4%	23.1%	1967	1975
Germany	1585	1461	825.2	1966.4	2.38293747	12.1%	20.4%	1994	1995
Hong Kong	1891	658	413.3	489	1.183159932	16.9%	39.2%	1991	1994
Ireland	1793	69	52.97	32.36	0.610911837	15.3%	19.9%	1990	No
Italy	1808	209	344.67	193.89	0.56253808	7.9%	26.3%	1991	1996
Japan	1878	1805	2160.58	834.45	0.386215738	12.2%	22.7%	1988	1990
Luxembourg	1929	62	33.89	0.56	0.016524048	10.6%	17.5%	1991	No
Netherlands	1600's	434	468.896	256.581	0.547202365	15.6%	17.8%	1989	1994
New Zealand	1870	146	29.889	9.29	0.310816688	3.2%	23.5%	1988	No
Norway	1819	196	66.5	46.27	0.695789474	10.7%	27.3%	1985	1990
Portugal	1825	159	39.3	20.14	0.512468193	6.7%	23.4%	1986	No
Singapore	1930	294	106.317	74.137	0.697320278	11.4%	20.3%	1973	1978
Spain	1831	133	290.383	424.086	1.460436734	10.8%	22.9%	1994	1998
Sweden	1863	261	264.711	164.623	0.621897088	15.1%	22.1%	1971	1990
Switzerland	1938	216	575.339	468.462	0.814236476	13.8%	19.1%	1988	1995
United Kingdom	1773	2157	1996.225	833.194	0.417384814	13.0%	23.4%	1980	1981
United States	1792	2691	8879.631	5777.6	0.650657668	12.2%	15.3%	1934	1961
Emerging Markets									
Argentina	1854	107	59.2	37.8	0.638513514	25.4%	58.5%	1991	1995
Armenia	1993	59	0.0131	0.0028	0.213740458	NA	NA	1993	No
Bahrain	1987	42	20.783	1.272	0.061203869	NA	NA	1990	No
Bangladesh	1954	219	1.5	3.8	2.533333333	NA	NA	1995	1998
Barbados	1987	18	1.14	0.0233	0.020438596	NA	NA	1987	No
Bermuda	1971	33	47	0.0964	0.002051064	NA	NA	No	No
Bolivia	1979	11	0.337	0.004	0.011869436	NA	NA	No	No
Botswana	1989	12	0.613	0.0565	0.092169657	NA	NA	No	No
Brazil	1890	536	255.4	191.1	0.748238058	19.1%	66.4%	1976	1978
Bulgaria	1991	285	0.388 (1998)	0.1268 (1998)	0.326804124	NA	NA	No	No
Chile	1893	92	72	7.328	0.101777778	20.9%	27.3%	1981	1996
China	1990	383	111.4	166.7	1.496409336	-18.2%	42.8%	1993	No
Colombia	1928	318	16.2	1.67	0.10308642	1.3%	28.7%	1990	No
Costa Rica	1976	114	0.8199	0.018	0.021953897	NA	NA	1990	No
Croatia	1918	82	4.265	0.2427	0.056905041	NA	NA	1995	No
Cyprus	1996	49	2.7	0.35	0.12962963	NA	NA	1999	No
Czech Republic	1871	300	14.36	21.54	1.5	-5.2%	28.8%	1992	1993
Ecuador	1969	128	2.02	62.6	30.99009901	NA	NA	1993	No
Egypt	1890	650	20.9	7.12	0.340669856	14.2%	25.7%	1992	No
El Salvador	1992	29	0.501	5.545	11.06786427	NA	NA	No	No
Estonia	1996	22	1.09	1.52	1.394495413	NA	NA	1996	No
Ghana	1989	21	1.135	0.1256	0.110660793	NA	NA	1993	No
Greece	1876	207	33.8	20	0.591715976	19.3%	37.1%	1988	1996
Guatemala	1986	5	0.002	NA	NA	NA	NA	1996	No
Honduras	1992	120	0.4477	0.348	0.777306232	NA	NA	1988	No
Hungary	1864	49	15	33	2.2	28.1%	45.7%	1994	1995
Iceland	1985	49	73.3	93.24	1.272032742	NA	NA	1989	No
India	1875	5843	127.72	49.9	0.390698403	-2.2%	27.9%	1992	1998
Indonesia	1912	282	29.05	21.87	0.752839931	3.3%	54.5%	1991	1996
Iran	1966	263	11.468	0.915	0.079787234	NA	NA	No	No
Israel	1953	659	44.37	13.58	0.306062655	1.9%	23.2%	1981	1989
Jamaica	1961	49	2.29	0.132	0.057641921	NA	NA	1993	No
Jordan	1978	139	5.45	0.5	0.091743119	0.1%	16.1%	No	No
Kazakhstan	1997	13	1.335	0.002	0.001498127	NA	NA	1996	No
Kenya	1954	50	1.9	0.1	0.052631579	NA	NA	1989	No
Kuwait	1984	65	25.88	NA	NA	NA	NA	No	No
Latvia	1993	50	0.338	0.083	0.24556213	NA	NA	No	No
Lebanon	1920	113	2.904	0.639	0.220041322	NA	NA	1995	No
Lithuania	1926	607	2.5	0.36	0.144	NA	NA	1996	No
Macedonia	1996	2	0.0086	0.0252	2.930232558	NA	NA	1997	No
Malawi	1996	3	NA	NA	NA	NA	NA	No	No
Malaysia	1973	708	93.18	101.3	1.087143164	1.1%	34.5%	1973	1996
Malta	1992	8	5	0.0205	0.0041	NA	NA	1990	No
Mauritius	1988	45	0.224	0.018	0.080357143	NA	NA	1988	No
Mexico	1894	155	156.2	52.8	0.338028169	23.2%	38.3%	1975	No
Moldova	1994	NA	NA	NA	NA	NA	NA	1995	No
Mongolia	1991	433	0.054	0.015	0.277777778	NA	NA	1994	No
Morocco	1929	49	12.23	3.33	0.272281276	25.1%	15.0%	1993	No
Namibia	1992	33	31.85	0.185	0.005808477	NA	NA	No	No
Nigeria	1960	182	3.67	0.147	0.040054496	NA	NA	1979	No
Oman	1988	119	8.738	4.196	0.480201419	NA	NA	1989	1999
Pakistan	1947	781	13.1	11.469	0.875496183	-13.4%	42.1%	1995	No
Palestine	1995	19	0.503	0.0252	0.050099404	NA	NA	No	No
Panama	1990	21	2.246	0.055	0.024487979	NA	NA	1996	No
Paraguay	1977	64	0.383	0.091	0.237597911	NA	NA	1999	No
Peru	1951	293	17.38	4.295	0.24712313	8.1%	37.5%	1991	1994
Philippines	1927	221	31.211	20.35	0.652013713	10.0%	35.9%	1982	No
Poland	1817	137	12.134	7.455	0.614389319	24.4%	60.6%	1991	1993
Romania	1882	84	0.633	0.26	0.410742496	NA	NA	1995	No
Russia	1994	149	71.592	16.634	0.232344396	-10.2%	90.4%	1996	No
Saudi Arabia	1984	70	59.37	16.55	0.278760317	NA	NA	1990	No
Slovakia	1991	14	5.29	2.37	0.448015123	NA	NA	1992	No
Slovenia	1924	86	1.99	0.32	0.16080402	NA	NA	1994	1998
South Africa	1887	615	211.599	38.71	0.182940373	6.6%	30.1%	1989	No
South Korea	1956	776	41.88	95.73	2.285816619	0.2%	40.2%	1976	1988
Sri Lanka	1896	239	2.09	0.297	0.142105263	-3.9%	33.7%	1987	1996
Swaziland	1990	4	0.13	0.357	2.746153846	NA	NA	No	No
Taiwan	1961	404	296.808	1290.92	4.349343683	8.6%	43.4%	1988	1989
Tanzania	1998	2	0.236	0.0003	0.001271186	NA	NA	1994	No
Thailand	1974	431	22.792	24.421	1.071472446	2.2%	42.6%	1984	1993
Trinidad and Tobago	1981	26	1.74	0.135	0.077586207	NA	NA	1981	No
Tunisia	1969	304	2.3	0.2	0.086956522	NA	NA	1994	No
Turkey	1866	258	61.095	58.104	0.951043457	8.2%	58.5%	1981	1996
Ukraine	1992	6	0.212	NA	NA	NA	NA	No	No
Uruguay	1867	18	0.211	0.004	0.018957346	NA	NA	1996	No
Uzbekistan	1994	63	0.041	0.028	0.682926829	NA	NA	No	No
Venezuela	1840	159	14.6	3.923	0.26869863	3.1%	58.4%	1998	No
Yugoslavia	1894	21	0.048	NA	NA	NA	NA	1997	No
Zambia	1994	10	0.502	0.008	0.015936255	NA	NA	1993	No
Zimbabwe	1896	67	2.32	0.35	0.150862069	NA	NA	No	No
Descriptive Statistics									
Median for Entire Sample	1953.5	127.5	14.8	4.92	0.338028169	0.106	0.273	1991	1994
Median for Developed Countries	1845	237	290.383	164.623	0.547202365	0.122	0.221	1989	1993.5
Median for Emerging Markets	1973.5	84	3.67	0.639	0.24634263	0.0495	0.379	1992	1995.5
Range for Entire Sample	1585 to 1998	2 to 5843	0.002 to 8879.631	0.0003 to 5777.6	0.00127 to 30.99	-18.2% to 28.1%	15.0% to 90.4%	1934 to 1999	1961 to 1999
Range for Developed Countries	1585 to 1938	62 to 2691	29.889 to 8879.631	0.56 to 5777.6	0.0165 to 2.3829	3.2% to 16.9%	15.3% to 39.2%	1934 to 1994	1961 to 1998
Range for Emerging Markets	1817 to 1998	2 to 5843	0.002 to 296.808	0.0003 to 191.1	0.00127 to 30.99	-18.2% to 28.1%	15.0% to 90.4%	1973 to 1999	1978 to 1999
Entire Sample(Today)								87 (84.47%)	38(36.95%)
Developed Countries(Today)								23(100%)	18((78.3%)
Emerging Markets (Today)								64(80%)	20(24.1%)
Entire Sample(Pre 1990s)								34(43%)	9(11.4%)
Developed Countries(Pre 1990s)								13(56.5%)	5(21.7%)
Emerging Markets (Pre 1900s)								21(37.5%)	4(7%)

Notes:

(1) The figures in the Establishment and the Company Listings column are from The Handbook of Stock, Derivative and Commodity Exchanges, 1998, International Financial Publications, London, UK. If not available, the source was the web site of the stck exchange.
(2) The figures in the Mkt Cap column are from FIBV, International Federation of Stock Exchanges (http://www.fibv.com). Whenever they were not available, the source was The Handbook of Stock, Derivative and Commodity Exchanges, 1998, International Financial Publications. London, UK. All local currency units were converted to USD by using the appropriate exchange rate on 12/31/97. This exchange rate came from the Currency Converter available in http://www.oanda.com/converter/classic.
(3) The figures in the Volume column are from The Handbook of Stock, Derivative and Commodity Exchanges, 1998, International Financial Publications. London, UK. They have been reconciled with the figures obtained from FIBV, International Federation of Stock Exchanges (http://www.fibv.com). All local currency units were converted to USD by using the appropriate exchange rate on 12/31/97. This exchange rate came from the Currency Converter available in http://www.oanda.com/converter/classic.
(4) Turnover is Volume divided by Market Capitalization.
(5) The arithmetic mean and standard deviation of monthly returns of the stock market indices were computed using the Morgan Stanley Capital International (MSCI) database.
(6) The figures in the last two columns came from the answers given to two questions we sent to all the national regulators and stock markets of the world in March 1999. The two questions were: 1) When (mm/yy), if at all, were insider trading laws established in your exchange? 2) If answer to 1) above is YES, when (mm/yy), if at all, was the first prosecution under these laws? Wherever possible, the answers were cross-checked with the following books in our law library:Posen, N., 1991, International Securities Regulation, Little, Brown and Company, Boston, USAand Stamp M. and C. Welsh (eds), 1996, International Insider Dealing, FT Law and Tax, Biddles Limited, Guildford, UK.

Table III

Effect of Insider Trading Laws on Liquidity

The pooled regressions are based on monthly data from 1969:12-1998:12. The dependent variable is "liq", and it is the natural logarithm of the ratio of volume to market capitalization. The independent variables are the insider trading variables. They are coded as follows. The indicator variable "IT laws" changes from 0 to 1 in the year after the insider trading laws are instituted. The indicator variable "IT enforcement" changes from 0 to 1 in the year after the first prosecution was recorded. The equity data are from Morgan Stanley Capital International. p-values in brackets were computed using the procedures suggested by Newey and West (1987).

Panel A: Insider Trading Laws

Dependent Variable	Liq	
Independent Variables	Coefficient	p-value
Intercept	-4.31564	0.000000
IT laws	0.59534	0.004608

Panel B: Insider Trading Enforcement

Dependent Variable	Liq	
Independent Variables	Coefficient	p-value
Intercept	-4.08272	0.000000
IT enforcement	0.62427	0.000000

Table IV

Effect of Insider Trading Laws on the Cost of Equity (Unadjusted)

The pooled regressions are based on monthly data from 1969:12-1998:12. The dependent variable is "rawret". It is defined as follows. "Rawret" is raw returns, and is computed as continuously compounded returns. The independent variables are the insider trading variables. They are coded as follows. The indicator variable "IT laws" changes from 0 to 1 in the year after the insider trading laws are instituted. The indicator variable "IT enforcement" changes from 0 to 1 in the year after the first prosecution was recorded. The equity data are from Morgan Stanley Capital International. p-values in brackets were computed using the procedures suggested by Newey and West (1987).

Panel A: Insider Trading Laws

Dependent Variable	Rawret	
Independent Variables	Coefficient	p-value
Intercept	0.01097	0.000000
IT laws	-0.00298	0.09734

Panel B: Insider Trading Enforcement

Dependent Variable	Rawret	
Independent Variables	Coefficient	p-value
Intercept	0.01033	0.000000
IT enforcement	-0.00395	0.053504

Table V

Effect of Insider Trading Laws on the Cost of Equity (Implicitly Adjusted)

The pooled regressions are based on monthly data from 1969:12-1998:12. The dependent variable is "div". It is defined as follows. It is computed as the sum of the dividend yield forecast and the growth rate of the dividend yield (dividend based measure). The independent variables are the insider trading variables. They are coded as follows. The indicator variable "IT laws" changes from 0 to 1 in the year after the insider trading laws are instituted. The indicator variable "IT enforcement" changes from 0 to 1 in the year after the first prosecution was recorded. The equity data are from Morgan Stanley Capital International. p-values in brackets were compute using the procedures suggested by Newey and West (1987).

Panel A: Insider Trading Laws

Dependent variable	Div	
Independent Variables	Coefficient	p-value
Intercept	0.01099	0.000000
IT laws	-0.00328	0.050215

Panel B: Insider Trading Enforcement

Dependent variable	Div	
Independent Variables	Coefficient	p-value
Intercept	0.01022	0.000000
IT enforcement	-0.00397	0.017897

Table VI

Effect of Insider Trading Laws on the Cost of Equity (Explicitly Adjusted for Risk)

The estimation is based on monthly data from 1969:12-1998:12. Excess returns are computed as continuously compounded returns minus the 3-month treasury bill rate.The insider trading variables were coded as follows. The indicator variable "IT laws" for existence changed from 0 to 1 in the year after the insider trading laws were instituted. The indicator variable "IT enforcement" for enforcement changed from 0 to 1 in the year after the first prosecution was recorded.The equity data are from Morgan Stanley Capital International. p-values in brackets were computed using the procedures suggested by Newey and West (1987). The model used is as follows:

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

$$\phi_{i,t} = \frac{\exp\left(\alpha_1\left(\frac{\text{exp}orts_t + imports_t}{gdp_t}\right)\right)}{1+\exp\left(\alpha_1\left(\frac{\text{exp}orts_t + imports_t}{gdp_t}\right)\right)}$$

Here "exports", "imports" and "gdp" are exports, imports and gdp respectively for the country of interest. λ_{cov} is the price of the covariance risk with the world, and λ_{var} is the price of own country variance risk. The conditional covariances and variances, $\mathrm{Cov}_t\,[r_{i,t}, r_{w,t}]$ and $\mathrm{Var}_t\,[r_{i,t}]$ respectively, are obtained from the multivariate ARCH model below

.

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

where

$r_{i,t}$ is the monthly return of the stock market index of country i at time t,
$r_{f,t}$ is the monthly return of the US 3month T-Bill at time t,
$r_{w,t}$ is the monthly return of the stock market index of the world at time t,
$\epsilon_{i,t-j}$ is the innovation in monthly return of the stock market index of country i at time t-j, $j \in \{0,1,2,3\}$,
$\epsilon_{w,t-j}$ is the innovation in monthly return of the stock market index of the world at time t-j, $j \in \{0,1,2,3\}$,
$h_{i,t}$ is the conditional variance of the monthly return of the stock market index of country i at time t,
$h_{w,t}$ is the conditional variance of the monthly return of the stock market index of the world at time t, and
$h_{i,w,t}$ is the conditional covariance of the return of the stock market index with the return of the world at time t.

Panel A: Risk Adjustment Model

Parameter	Coefficient	p-value
α_0	0.00140	0.486980
α_1	8.42592	0.044476
λ_{cov}	1.40719	0.235540
λ_{var}	2.03703	0.002575

Panel B: Effect on Residuals (Risk adjusted)

Dependent Variable	Residual from Risk Adjustment Model	
Independent Variables	Coefficient	p-value
IT laws	-0.00048	0.683983
IT enforcement	-0.00271	0.076975

Table VII

Effect of Insider Trading Enforcement on the Cost of Equity (Explicitly Adjusted for Risk, Foreign Exchange Risk, Liquidity and Other Shareholder Rights)

The estimation is based on monthly data from 1969:12-1998:12. Excess returns are computed as continuously compounded returns minus the 3-month treasury bill rate.The insider trading variables were coded as follows. The indicator variable "IT laws" for existence changed from 0 to 1 in the year after the insider trading laws were instituted. The indicator variable "IT enforcement" for enforcement changed from 0 to 1 in the year after the first prosecution was recorded.The equity data are from Morgan Stanley Capital International. p-values in brackets were computed using the procedures suggested by Newey and West (1987). The model used is as follows:

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

$$\phi_{i,t} = \frac{\exp\left(\alpha_1\left(\frac{\text{exports}_t + \text{imports}_t}{gdp_t}\right)\right)}{1+\exp\left(\alpha_1\left(\frac{\text{exports}_t + \text{imports}_t}{gdp_t}\right)\right)}$$

Here "exports", "imports" and "gdp" are exports, imports and gdp respectively for the country of interest. λ_{cov} is the price of the covariance risk with the world, and λ_{var} is the price of own country variance risk. The conditional covariances and variances, $\text{Cov}_t\,[r_{i,t}, r_{w,t}]$ and $\text{Var}_t\,[r_{i,t}]$ respectively, are obtained from the multivariate ARCH model below:

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

where

$r_{i,t}$ is the monthly return of the stock market index of country i at time t,
$r_{f,t}$ is the monthly return of the US 3month T-Bill at time t,
$r_{w,t}$ is the monthly return of the stock market index of the world at time t,
$\epsilon_{i,t-j}$ is the innovation in monthly return of the stock market index of country i at time t-j, $j \in \{0,1,2,3\}$,
$\epsilon_{w,t-j}$ is the innovation in monthly return of the stock market index of the world at time t-j, $j \in \{0,1,2,3\}$,
$h_{i,t}$ is the conditional variance of the monthly return of the stock market index of country i at time t,
$h_{w,t}$ is the conditional variance of the monthly return of the stock market index of the world at time t, and
$h_{i,w,t}$ is the conditional covariance of the return of the stock market index with the return of the world at time t.

The conditional covariance $\text{Cov}_t\,[r_{i,t}, r_{ifx,t}]$ is obtained from the multivariate ARCH model below:

$$r_{i,t} = f_1 + \varepsilon_{i,t},$$

$$r_{ifx,t} = f_2 + \varepsilon_{ifx,t},$$

$$h_{i,t} = e_1 + d_1\left(\tfrac{1}{2}\varepsilon^2_{i,t-1} + \tfrac{1}{3}\varepsilon^2_{i,t-2} + \tfrac{1}{6}\varepsilon^2_{i,t-3}\right),$$

$$h_{ifx,t} = e_2 + d_2\left(\tfrac{1}{2}\varepsilon^2_{ifx,t-1} + \tfrac{1}{3}\varepsilon^2_{ifx,t-2} + \tfrac{1}{6}\varepsilon^2_{ifx,t-3}\right),$$

$$h_{i,ifx,t} = e_3 + d_3\left(\tfrac{1}{2}\varepsilon_{i,t-1}\varepsilon_{ifx,t-1} + \tfrac{1}{3}\varepsilon_{i,t-2}\varepsilon_{ifx,t-2} + \tfrac{1}{6}\varepsilon_{i,t-3}\varepsilon_{ifx,t-3}\right),$$

$$\varepsilon_{i,t}, \varepsilon_{ifx,t} \sim N\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix} h_{i,t} & h_{i,ifx,t} \\ h_{i,ifx,t} & h_{ifx,t}\end{bmatrix}\right),$$

where

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

Panel A: Risk Adjustment Model

Parameter	Coefficient	p-value
α_0	0.00140	0.486980
α_1	8.42592	0.044476
λ_{cov}	1.40719	0.235540
λ_{var}	2.03703	0.002575

Panel B1: Effect on Residuals (Risk adjusted)

Dependent Variable	Residual from Risk Adjustment Model	
Independent Variable	Coefficient	p-value
IT enforcement	-0.00271	0.076975

Panel B2: Effect on Residuals (Risk and Foreign Exchange Factor Adjusted)

Dependent Variable	Residual from Risk Adjustment Model	
Independent Variables	Coefficient	p-value
Foreign exchange, $Cov_t [r_{i,t}, r_{ifx,t}]$	-0.14426	0.732075
IT enforcement	-0.00303	0.049364

Panel B3: Effect on Residuals (Risk, Foreign Exchange Factor, and Liquidity Factor Adjusted)

Dependent Variable	Residual from Risk Adjustment Model	
Independent Variables	Coefficient	p-value
Foreign exchange, $Cov_t [r_{i,t}, r_{ifx,t}]$	0.70186	0.573207
Liquidity	0.00011	0.795467
IT enforcement	-0.00359	0.096643

Panel B4: Effect on Residuals (Risk, Foreign Exchange Factor, Liquidity Factor, and Shareholder Rights Adjusted)

Dependent Variable	Residual from Risk Adjustment Model	
Independent Variables	Coefficient	p-value
Foreign exchange, $Cov_t [r_{i,t}, r_{ifx,t}]$	0.67851	0.590009
Liquidity	0.00064	0.320520
Shareholders rights	0.00103	0.212352
IT enforcement	-0.00461	0.061585

Table VIII

Effect on Country Rating

The pooled regressions are based on bi-annual data from 1979:2-1998:2. The dependent variable is "cr", which represents a country credit rating. They come from Institutional Investor's semi-annual survey of bankers. The survey represents the responses of 75-100 bankers. Respondents rate each country on a scale of 0 to 100. The independent variables are the insider trading variables, which are coded as follows. The indicator variable "IT laws" for existence changed from 0 to 1 in the year after the insider trading laws were instituted. The indicator variable "IT enforcement" for enforcement changed from 0 to 1 in the year after the first prosecution was recorded. p-values in brackets were computed using the procedures suggested by Newey and West (1987).

Panel A: Insider Trading Laws

Dependent Variable	cr	
Independent Variables	Coefficient	p-value
Intercept	43.90414	0.000000
IT laws	11.91070	0.000012

Panel B: Insider Trading Enforcement

Dependent Variable	cr	
Independent Variables	Coefficient	p-value
Intercept	45.41131	0.000000
IT enforcement	26.72267	0.000000

Figure 1. Insider Trading Regulations in the Twentieth Century