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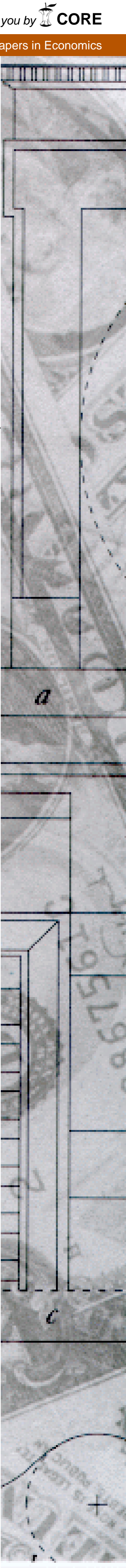

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The Future of Stock Exchanges in Emerging Economies: Evolution and Prospects

by
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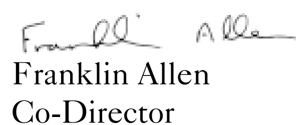

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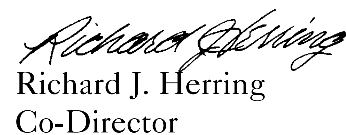

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The Future of Stock Exchanges in Emerging Economies: Evolution and Prospects

by

Stijn Claessens, Daniela Klingebiel, and Sergio L. Schmukler*

February 4, 2002

Abstract

We study the determinants of stock market development and the growing migration of capital raising, listing, and trading activity to international exchanges. Economies with better fundamentals have larger and more liquid markets. As fundamentals improve, however, the degree of migration to international exchanges also increases. This leads to gains for corporations in the form of lower costs and more liquidly-traded shares. Fully-fledged local stock exchanges are thus becoming less necessary for many economies. Furthermore, migration can leave too little domestic activity to sustain a local exchange. Therefore, the functions and forms of stock exchanges in many economies need rethinking.

JEL classification codes: G15, G18, G20

Keywords: stock exchange development; internationalization of financial markets; trading migration; emerging economies; cross-listing; ADRs; GDRs

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1. Introduction and motivation

Financial markets, and especially stock markets, have grown considerably in developed and developing countries over the last two decades. Better fundamentals (higher economic growth, more macro stability), structural reforms (notably privatization of state-owned enterprises), and specific policy changes (notably domestic financial reform and capital account liberalization) have aided in their growth. Globalization has also advanced in the last two decades with increased cross-border capital flows, tighter links among financial markets, and greater commercial presence of foreign financial firms around the world.

An element of the globalization trend has been the migration of stock exchange activities abroad, particularly in the case of emerging markets. Many firms from emerging economies now cross-list on international exchanges. Depositary Receipts (DRs), for example, are increasingly popular instruments.[1] In 1999, U.S. $533 billion in DRs were recorded on the New York Stock Exchange (NYSE) alone. And some $29 billion in new equity was raised through DRs in 2000 through 115 depositary receipt offerings in the United States and European markets, a 32 percent increase over 1999. Trading has also been migrated abroad and local stock exchanges have seen liquidity diminish. Trading in American Depositary Receipts (ADRs) amounted in 2000 to $1,185 billion or some 17 percent of trading in corresponding local exchanges.

Advances in technology have further accelerated the globalization trend. In particular, remote access to trading systems is ubiquitous, implying that the services offered by stock exchanges can now easily be accessed from anywhere, including firms having their stocks traded on international exchanges while still being easily accessible to

local investors. Given the network properties of stock exchanges, high liquidity further increases the value of additional transactions at exchanges such as New York or London, leading to more concentration of order flow and further increasing liquidity at these exchanges. Migration of trading abroad is putting pressure on many local exchanges, especially in Latin America, but also elsewhere, such as in Central Europe as volumes decline and income from trading activities is reduced.

Going forward, these global trends are likely to accelerate as access to information improves, standards—concerning corporate governance, listing and accounting—are further harmonized, technology further advances and intermarket linkages increase. These trends are raising questions on the emphasis countries need to place on developing their own stock exchange as means to assure efficient resource mobilization and allocation for their corporate sectors. To shed light on the costs and benefits of these trends, it is necessary to address a number of related questions. How have stock markets developed around the world and what factors drive their general development? Are the trends of internationalization common across all regions and countries? Which factors affect internationalization in particular? Is the increased migration a function of improved fundamentals or a reflection of corporations fleeing domestic financial systems that are institutionally weak and have a limited investor base? Does the degree of migration depend on the size of the local market?

The answers to these questions require an analysis of the determinants of stock market development across the globe, the causes of internationalization, and the effects on local exchanges. This paper investigates some of these questions by describing and analyzing the patterns and determinants in market capitalization and trading domestically for 77 countries between 1975 and 2000. Using individual firm data starting from 1983

on, we aggregate for each country and year individual capitalization, trading, and capital raising figures of all international companies to get different measures of the degree of internationalization. We then analyze the three components of the internationalization process—listing, trading, and capital raising—for a large cross-section of countries, report on the factors driving these components, and compare these factors to those driving stock markets development in general.

We find that there are a (small) number of fundamental factors that affect in a similar way both the development of the local market as well as the degree to which countries participate in international markets. As countries improve their fundamentals, stock exchange activity increases, but so does the share of activity taking place abroad. This suggests that the two are complementing processes: as better fundamentals allow local markets to develop, so will there also be an increased tendency for firms to access global exchanges. But there will be limits of increased local development being associated with an increased share of offshore activity. Migration of a major share of market capitalization and value traded may have adverse consequences for remaining companies' liquidity.[2] Large scale migration may also make it more difficult to sustain a fully fledged local stock exchange, in a narrow sense—to pay for the fixed overhead of maintaining trading, clearing, and settlement systems, among other things—and in a broader sense—to generate enough order flow for local brokers and enough business for local investment banks, accounting firms, and other supporting services.

Policy implications of these findings are that countries will need to continue to improve fundamental factors—such as shareholder protection and the quality of local legal systems—to make it more attractive for any investor to buy shares and thus to make it easier for firms to list in public markets, have their shares properly valued and, trade

liquidly. Our results also imply that countries do not face a choice between local and international exchanges: improving fundamentals will lead to more activity, but most of this activity will go abroad as better fundamentals also accelerate the degree of migration.

The implications are that countries will be best off facilitating as much as possible the access of their firms to international exchanges—by removing regulatory barriers and harmonizing standards—to allow them to reap the gains from more liquid exchanges overseas. Moreover, tighter links or even mergers with global exchanges may be necessary as not doing so will lead to a sure decline of the local market. This does not necessarily mean that there is not a role whatsoever for local exchanges; there may still be a role for a locally provided mechanism that allows firms to come to the market for the first time.

The paper is structured as follows. Section 2 reviews the related literature. Section 3 provides a description of the data and illustrates some of the main trends in stock market development and the degree of internationalization over time and across our sample of countries. Section 4 reports on the factors which explain the capitalization, listing, capital raising, and trading trends, both domestic and abroad. Section 5 concludes.

2. Review of related literature

We study several aspects of stock market development: market capitalization, listing, degree of new capital raising, and trading value. We study most of these aspects both from the domestic and international side. Some of these aspects of stock market

development have been studied in several research strands. We discuss these strands here briefly.

The determinants of financial sector development have become a much-researched area lately.[3] King and Levine,[4] La Porta, Lopez-de-Silanes, Shleifer, and Vishny,[5] Rajan and Zingales,[6] Beck, Demirguc-Kunt, Levine, and Maksimovic,[7] Henry,[8] Bekaert, Harvey, and Llundblad,[9] Demirguc-Kunt and Levine,[10] and a number of others have analyzed the legal foundations of financial markets. They have also studied the relation of financial market development with macroeconomic variables, financial reform, and other country factors, and the relations among the development of the various parts of a financial system. The general finding is that financial markets tend to develop as income per capita grows and financial reform progresses. Stock market development specifically has been shown to depend on a good legal system, particularly minority rights that are being enforced. Stock market development also appears to complement the development of other parts of the financial system and be complementary to other forms of finance in affecting growth, both at the aggregate level as well at the individual firm level.

The determinants of stock market capitalization have been analyzed for specific groups of countries in some papers. Catalan, Impavido, and Musalem examine the determinants of stock market development for OECD and some emerging markets, studying 27 countries in total.[11] They find that, apart from macro stability and legal rights, the size of the institutional investor bases positively affects stock market development, and report evidence of a causal times series relation between institutional investors and stock market development. Claessens, Djankov, and Klingebiel investigate the development of stock markets in a panel of transition economies and highlight the role of privatization for stock market development in this sample of countries.[12] Perotti

and van Oijen also study privatization and find an indirect positive relation of a program of privatization—through political risk reduction—on stock market development in a sample of 31 emerging economies.[13]

Papers have focused less on the factors determining trading behavior, although the liquidity of the stock market has been found to be a useful predictor of future economic growth.[14] In part this reduced attention on trading may be because there are large differences across otherwise similarly developed countries in the degree to which stocks are traded. Some emerging markets, South Korea and Taiwan, for example, have much higher trading volumes than many developed countries, while trading in other emerging markets is much lower than that in most developed countries. These, presumably institutional-driven differences have made it more difficult to come up with explanatory factors for trading intensity. One of the few cross-country studies on trading is Domowitz, Glen, and Madhavan.[15] They document the relations between turnover, equity trading costs, and volatility, and investigate the determinants of domestic trading. They show, among other things, that turnover is inversely related to trading costs, providing a possible explanation for the increase in turnover in recent years as direct costs (commissions, fees) have declined. Jain analyzes the effects of different institutional designs for stock exchanges and trading systems—such as tick size, trading mechanism, and order flow rules—on bid-ask spreads, volatility, and trading turnover.[16]

The determinants of (new) domestic offerings at the firm level have been much studied. Pagano, Panetta, and Zingales, for example, provide a recent review and analysis of why companies go public.[17] Subrahmanyam and Titman extend this literature to a cross-country context by developing a model of the relation between the going public decision and local financial market development.[18] Empirically, Domowitz, Glen, and

Madhavan study the determinants of aggregate new offerings (domestic and abroad), covering both debt and equity on a cross-country basis.[19] They find that complex and significant intertemporal correlations exist among various financing choices. The level of overall primary market activity across countries is related to the accounting framework, the level of investor protection, and the extent of access to the local market for foreign investors. They also find that privatization influences foreign offerings and domestic bond market development.

The means and motivations for listing abroad have been studied for different groups of firms and countries. Ljungqvist, Jenkinson, and Wilhelm investigate the costs and benefits of global integration of primary markets associated with the spread of U.S. underwriting methods.[20] They find that the U.S.-style investment banking methods add value to a corporation in the sense of increasing the net amount raised, but that the decision where to list is not related in a significant way to the cost issue. Miller and Foerster and Karolyi empirically analyze the importance of broadening the investor base as a motivation for foreign stock listing into the U.S.[21] Pulatkonak and Sofianos also study the determinants of listing in the U.S.[22] They find that time-zone distance from the U.S., if the country is an emerging market, and the level of trading costs explain a large fraction of the decision to list in New York. Pagano, Roell, and Zechner study the determinants of European firms listing abroad.[23] They find that firms with high growth (potentials) and in high-tech industries are more likely to list in the U.S., whereas firms that cross-list within Europe do not grow more than a control group. Sarkissan and Schill study a very large sample of cross-listing in many markets.[24] They find evidence of a proximity effect, that is, geographical proximity and other affinity factors such as trade links and common language determine cross-listing. Diversification gains seem to matter

little as cross-listing is more, not less, common across markets where returns are highly correlated.

The relation between cross-listing and local market development has also been studied. Hargis shows theoretically how international cross-listings can transform a segmented local equity market with low liquidity and market capitalization to an integrated market with high liquidity and market capitalization, by altering the incentives of companies and individuals to participate in the market.[25] He shows theoretical that the benefits of cross-listings depend on the degree of correlation between the domestic and world equity market and the relative size of the domestic equity market. Moel studies the role of ADRs in the development of emerging stock markets.[26]

Reese and Weisbach study the relation between cross-listing and the quality of the corporate governance framework in the home country of the firm.[27] They find that the weaker the framework at home, the more likely firms are to list abroad to attempt to protect the minority rights of shareholders. Listing abroad can thus be a tool for corporations to signal to their investors that they are more willing to protect minority rights as corporate governance rules are stronger abroad. Pagano, Panetta, and Zingales find similar results for European corporations.[28] Doidge, Karolyi, and Stulz find evidence that corporate ownership and the agency costs related to dominant controlling shareholders can motivate cross-listings and be important for differences in the valuation of growth opportunities between local and global markets.[29] Miller and Puthenpurackal find that by raising bonds abroad (in the U.S.), corporations certify to act in the interest of investors and thus lower their borrowing costs and increases shareholders' wealth.[30]

There are also studies on the effects of foreign initial or subsequent offerings at the individual firm level, which are helpful to identify some of the factors motivating firms to

list or trade abroad.[31] Foerster and Karolyi study different forms of global equity offerings and their relations to long-term equity returns.[32] Chaplinksy and Ramchand show that global offers are effective in expanding demand and reducing the price pressure effects associated with share issuance.[33] Lins, Strickland, and Zenner show that firms from emerging markets that use DRs or list on the U.S. equity markets see their financing constraints relaxed, in the sense that their sensitivity of new investment to internal cash flow is reduced.[34] Schmukler and Vesperoni also find that domestic firms that participate in international markets obtain better financing opportunities and extend their debt maturity.[35]

Reese and Weisbach also study the effects of cross-listing on subsequent equity offerings and find that offerings increase following cross-listing, especially from lower shareholder protection countries.[36] Baker, Nofsinger, and Weaver show that international cross-listings raise firm visibility, increasing analyst coverage and media attention.[37] This is turn may lead to lower cost of capital, although they do not study this. Doidge shows that following listing in the U.S., foreign firms' ownership becomes less concentrated with reduced family and management control and more public ownership.[38] Changes in ownership concentration may have implications for the degree of trading as the free float is increased with foreign listing.

There are also some firm- and country-specific studies on the effects of trading migrating abroad. Karolyi studies the effects of different institutional arrangements on trading for the case of DaimlerChrysler, a single global registered share, in Frankfurt and New York. He finds that the structure of the global share facility cannot be credited with improvements in liquidity nor can it be blamed for the flow-back to Frankfurt, suggesting that the gains from cross-listing in terms of trading and price discovery are not obvious.[39]

Lastly, our work relates to the analysis of the determinants, structure, and evolution of trading systems, and possible impacts of changes in trading systems on market capitalization, turnover, and migration. Clayton, Jorgensen, and Kavajecz find, studying 248 financial exchanges, that the main determinants for exchange formation are the degree of freedom in the country, the size of its economy, the availability of technology and the quality of its legal system.[40] Schmiedel analyzes the technical efficiency of financial exchanges in Europe.[41] He finds statistically significant inefficiencies, on the order of 20-25 percent, which can be explained, among others, by size. Not meeting a minimum size for efficient provision of trading services, combined with increased cross-border flow of information and capital, may thus be a motivating factor for the migration abroad and the trend towards consolidation of trading systems. Domowitz and Steil highlight the impact of a reduction in trading costs, as experienced in many markets, on turnover directly, and the much more important indirect effects of a reduction in trading costs on the cost of equity.[42] Steil analyzes the effects of technological advances on securities trading industries globally, with particular emphasis on the implications for developing countries.[43] These last studies also discuss the global trends towards consolidation in trading systems and associated clearing and settlement systems, in part as responses of increased competition among exchanges.

As evident from this review, there is a wide range of research studies on the development of local capital markets and the internationalization of equity markets. However, as far as we know, there is no study that analyzes which factors explain the internationalization of stock exchange activity relative to the development of local exchange activity and the implications of this migration abroad for local exchanges. Furthermore, while it is generally believed that trading is more liquid in international

exchanges than in most local exchanges, no cross-country studies exist on the degree and determinants of liquidity of local shares in international markets. We believe that these issues are addressed for the first time in this paper.

3. Data

This section describes the data used in the paper. First, we discuss the data sources. Second, we present summary statistics of the variables under study.

3.1 Data sources

As noted above, we are interested in several aspects of the development of stock exchanges: market capitalization, listing, trading volume, and degree of new capital raising. For all, we are interested in both the domestic and foreign dimension. Getting data and documenting these various trends is not easy, however, especially as we want to be as comprehensive as possible and cover as many countries and as long a times series as possible. While there are several data sources on market capitalization and trading volumes that cover a large number of countries, there is no comprehensive database on the degree of new capital raising domestically. There is even less comprehensive data available on the degree to which securities are being listed and traded abroad and the degree of capital raising in foreign markets. We therefore need to combine a number of sources. The list of countries covered and the groupings by income level are provided in Appendix Table I, while the data sources are detailed in Appendix Table II.

On domestic activity, the dollar amounts of market capitalization and value traded on the major domestic stock exchanges come from the International Finance

Corporation's (IFC's) Emerging Markets Factbook, now named the Standard & Poor's Emerging Markets Database. These data have typically been used to measure the importance of stock markets in financial systems around the world, the contribution of stock markets to firm financing, and the relation between stock markets development and economic growth. The data cover only the major stock exchange in the country. The data also only cover listing and trading on formal, organized public exchanges and ignores any over-the-counter trading and other markets' trading. As such, it underestimates the country's total market activity. The value of new equity issued on the respective local stock exchange is the total value of public offerings and rights issued during the period, excluding stock dividends or bonus shares that do not raise cash. Its source is also the Standard & Poor's Emerging Markets Database. The dataset on domestic activity covers the period January 1975 – November 2000 for 82 countries, but the maximum number of countries that we analyze is 77 due to data availability on other variables.

On foreign activity, we have data from Bank of New York, which covers the three major stock exchanges in the U.S.: NYSE, NASDAQ, and AMEX. The base list of companies with DR programs comes from two Bank of New York sources: the Complete DR Directory and a database with the value traded at the ticker level. These two datasets contain the list of current DR programs and the effective date of each program. As of March 2001, there were a total of 2,206 listed programs. The DR Directory includes all currently active programs, dating back to January 1956, with most of them being initiated after 1980. The resulting database accounts for 1,951 active DR programs from 1,524 firms in 80 countries. However, these two databases do not include DR programs that were terminated before March 2001. To account for these programs, we use an

additional database, also provided by Bank of New York, that lists all terminated DR programs (650 programs in total as of January 31, 2001). The set of terminated DR programs relevant for our study amounts to 214 firms that are added to the list of firms with DR programs.

In terms of trading abroad, we focus on trading in DRs. One dataset on DR value traded comes also from Bank of New York and covers the period 1989 – November 2000.[44] Companies that are not shown to be trading according to Bank of New York are assigned a zero. We also have data on value traded by foreign firms on the London Stock Exchange (LSE) for 45 countries for the period January 1998 – November 2000. The values reported by LSE were converted to current U.S. dollars using the average monthly exchange rates as reported in the International Financial Statistics from the International Monetary Fund (IMF). However, given that the time span of the LSE data is much more limited, we focus our analysis on the Bank of New York data on DR trading in New York.[45]

On capital raised abroad, we use a combination of two different datasets. One comes from the Bank of New York, which covers capital raised though depositary receipts for the period May 1980-November 2000. It contains 1,178 operations from 864 firms in 54 countries. The other dataset covers all operations of capital raised in international markets by firms and is compiled by Euromoney. This database provides a more comprehensive account of capital raised, because it includes DR programs and cross-border listings. It reports 8,795 operations from 5,665 firms in 86 countries, covering the period January 1983 – April 2001. By combining these two datasets, we create a series on capital raised in foreign markets.[46] Capital raised abroad, as we define it, thus refers to the sum of the amount of new equity financing which is obtained by

using a non-domestic instrument, such as a foreign listing or an ADR, and any new equity issue abroad.

The data from Bank of New York and Euromoney allow us to construct a list of the "international" companies for each country. These are companies that cross-list, directly or via DRs, or raise capital in international stock markets. We use this variable to study the degree of listing on international exchanges. In fact, this variable is more general, because it also captures capital raising without listing. We do not, however, consider the degree to which foreign investors hold shares traded in local markets as an indication of internationalization of the firm. It would be almost impossible to construct such a series because most countries do not distinguish between local and foreign investors in the domestic market. Similarly, we do not consider to what degree domestic residents hold domestic shares in the international markets.

3.2 Descriptive statistics

Based on the data compiled, we focus on eight variables of interest, three for the development of local stock exchanges and five for the internationalization of stock exchanges. The former are *market capitalization over gross domestic product* (GDP*), value traded domestically over GDP*, and *value traded over market capitalization* (also known as turnover ratio). The latter are *market capitalization of international firms over total market capitalization* (here equal to the domestic market capitalization),[47] *value traded abroad over GDP*, *value traded abroad over value traded domestically*, *capital raised abroad over GDP*, and *capital raised abroad over capital raised domestically*. In all cases we work with annual data. Stock data are all end-of-year data. We exclude the

U.S. and U.K. markets, as they are the international financial centers on which basis we define a firm's internationalization.

The variable market capitalization of international firms over total market capitalization captures the degree of listing on international stock exchanges. The numerator of this variable is the sum of market capitalization of firms defined as international, according to the criteria described above. The variable value traded abroad over value traded domestically shows the relative importance of international activity. Both an increase in international trading and a decrease in local trading will produce a rise in this variable. To isolate these effects, we also look at another variable, value traded abroad over GDP. The same applies to capital raised.

Tables 1, 2, and 3 provide descriptive statistics on the eight variables for the years 1990 and 2000. We also use three figures to describe the aggregate trends in the data over time and by country groupings. Figure 1 plots market capitalization as a ratio to GDP and domestic value traded as a ratio to GDP and as a ratio to market capitalization. Figures 2 and 3 plot the variables related to the internationalization of stock exchanges. Those figures differentiate trends by groups of countries according to income level.

As is well known, Figure 1 shows that there has been a gradual increase in market capitalization for all three groupings, with an acceleration in the 1990s for the high-income countries. Table 1 shows that, for all countries combined, the ratio of market capitalization to GDP increased from a mean (median) of 31 (18) percent in 1990 to some 62 (34) percent in 2000. This increase in market capitalization reflects both generally higher prices for existing stocks as well as increased number of listings. For high-income countries, for example, the average number of companies listed on a domestic exchange in a country increased from 703 in 1990 to 900 in 1999. Taking a longer perspective, the

relative increase in market capitalization has been the most pronounced in high-income countries, with a six-fold increase in the average ratio of market capitalization to GDP between 1975 and 2000, from 22 percent to close to 117 percent (see Figure 1). In low-income countries, there has been a quadrupling in market capitalization, from 5 percent to 20 percent of GDP. In middle-income countries, however, market capitalization did not increase much, only from 37 percent to 45 percent of GDP. These countries seem to have lost out in the 1990s, increasing their market capitalization by only 8 percentage points, when stock markets in high-income countries grew by some 75 percentage points (Table 1). Middle-income and low-income countries end up with market capitalization in 2000 much below that of high-income countries, on average 70 and 100 percentage points respectively less.

Yet these averages hide some differences within the groups. On the basis of the median, for example, middle-income countries saw a doubling in market sizes over the 1990s, while the mean market size only increased by a quarter, as some markets increased very little, if at all. There are also large differences among regions in the size of markets and their growth.[48] Among emerging markets, East Asian countries have still the largest markets relative to GDP, although growing at a slower pace relative to transition economies and Latin American countries. Transition economies have seen fast growth in market capitalization, but from very low or non-existing bases, and are currently the group with the lowest average market capitalization. Following a period of rapid increase in the late 1980s, Latin American markets continued growing, but their markets are still only one third (relative to GDP) of those in East Asia. More generally, there are large differences around the world. The country with the highest aggregate stock market capitalization relative to their GDP in our sample in 2000 is Hong Kong,

with a stock market capitalization of 383 percent; the country with the lowest market capitalization is Bangladesh with 2.5 percent.

Value traded as a ratio to GDP has grown strongly in the high-income group with an almost 20-fold increase over the 1975-2000 period. Growth has been much less pronounced in the middle- and low-income group with only a ten-fold increase. The growth patterns in value traded mimic those in market capitalization as they mainly capture the overall growth of markets (see Figure 1). As before, low-income countries and middle-income countries have much lower ratios of value traded to GDP than high-income countries do. There are again large variations between countries, however. Some middle-income countries had very high value traded for some years. For Taiwan in 1988, for example, the ratio of value traded to GDP was 224 percent. In 2000, value traded in East Asian countries was 87 percent of GDP, while in Eastern Europe and Latin America it was only about 4 percent. The relative slow growth of value traded during the 1990s in Latin America might be explained by limited price increases, de-listings, and migration of trading abroad.

The pattern is different, however, when comparing value traded relative to market capitalization. Here the distinction between the three groups is less strong. Nevertheless, high-income countries have generally more liquid markets than middle-income countries do and middle-income countries in turn tend to have more liquid exchanges than low-income countries do. The mean value traded ratio in 2000 was 86 percent for high-income countries, 47 percent for middle-income countries, and 29 percent for low-income countries (Table 1). For all three groupings, value traded as a fraction of market capitalization has risen, especially in the second half of the 1990s, the fastest for the middle- and high-income countries. Differences between countries remain large,

however, with many middle-income countries having higher value traded ratios than high-income countries on average do.

Figures 2 and 3 plot a number of internationalization indicators, with some descriptive statistics of the data provided in Tables 2 and 3. Figure 2 and Table 2 display three indicators of the relative importance of internationalization: market capitalization of international firms relative to market capitalization of all firms, value traded abroad relative to GDP, and value traded abroad relative to value traded domestically. Figure 3 and Table 3 provide two other indicators of the degree of internationalization: capital raised abroad over GDP and capital raised abroad over capital raised domestically. Again, the indicators are split by the three groups of countries.

The plot of the ratio of market capitalization listed abroad to total market capitalization shows clearly how strong the internationalization trend has been over the past few years, especially for middle-income countries. For these economies, the ratio of market capitalization listed abroad to total market capitalization jumped from only a few percentage points in 1989 to about half, with a peak of over 62 percent in 1999. In low- and high-income countries, the ratio of foreign to total market capitalization rose by a quarter. In 2000, market capitalization of international firms over total market capitalization stood at an average (median) 31 (37) percent for high-income countries, 55 (62) percent for middle-income countries, and 27 (14) percent for low-income countries. With 95.7 percent in 2000, Israel had the highest ratio of foreign to total market capitalization. Here too, one can observe considerable regional differences. In 2000, the Eastern Europe region had the highest ratio of market capitalization listed abroad with 49 percent, followed by East Asia with 37 percent, and the Latin America region with 33

percent. Firms listed abroad accounted just for 19 percent of total market capitalization in Africa.

Of course, the (increasing) market capitalization listed abroad is accounted for by a relatively small number of companies as typically larger companies list abroad, but the growth in numbers has been large. For middle-income countries, the average number of companies listed abroad increased from 3 in 1990 to 25 in 2000. Low-income countries had on average 18 companies listed abroad in 2000. With more companies listing abroad, high-income countries experienced the highest increase on average in terms of numbers. While on average only 35 companies were trading abroad in 1990, this number increased to 177 in 2000 for the high-income countries.

Similar trends can be observed for the ratio of trading abroad to domestic trading; a pronounced increase for middle-income countries during the 1990s and a slow increase for low-income countries in the last few years. The trading ratio for middle-income countries rose from a few percentage points to some 40 percent in 2000. At the same time, the average ratio of trading abroad to home rose from 0 to 7 percent for low-income countries. The high-income country group appears to have had less of a change in trading migrating abroad in the last few years, with the ratio fluctuating between 15 percent and 20 percent.[49]

In terms of capital raised abroad, the trends towards internationalization in the last few years are striking as well. For various years between 1989 and 2000, the amount of capital raised abroad exceeded the amount raised domestically for middle-income countries, with a peak in the ratio of 3.7 in 2000. For low-income countries, the ratio has been more volatile, but capital raised abroad amounted on average to some 26 percent of capital raised domestically in 2000. Not surprisingly, since some of the high-income

countries are financial centers in their own right, capital raised abroad exceeded the amount of domestic capital raised in high-income countries only in the years 1990, 1991, and 1997.

As a ratio to GDP, the figures for value traded abroad and capital raised abroad for the three groups of countries are similar to those relative to domestic activity. Since internationalization is now adjusted by the size of the economy, rather than by the size of the local stock market, the relative importance appears different, however. In middle-income countries, trading abroad represented only two percent of GDP as trading itself was only a small ratio to GDP, but amounted to 40 percent of domestic trading in 2000. This is similar so for the trends in capital raised abroad, which increased from virtually nil in 1990 to 0.27 percent of GDP for middle-income countries and to 0.18 percent of GDP for low-income countries in 2000. High-income countries experienced the highest growth in capital raised abroad, from less than a quarter of a percentage point in 1990 to almost 2 percentage points in 2000.

4. Explaining the trends in stock market development and migration

We try to explain stock market development and the trends towards internationalization of stock exchanges, including differences among countries, by investigating the role of country and international factors. We explore several groups of explanatory variables. We use the overall level of development of the country, as captured by GDP per capita and the size of its economy. For macroeconomic performance, we use the inflation rate. For the quality of the institutional framework, we use the law and order index, as reported by the Country Risk Guide, and the strength of

shareholders rights, as reported by La Porta, Lopez-de-Silanez, Shleifer, and Vishny[50] and Pistor, Raiser, and Gelfer.[51] We also use a variable related to the trading system in the country, namely trading commissions and trading fees.[52] Finally, for ease of foreign ownership in the stock market, we use the measure of capital account liberalization reported by the IMF[53] and the index of financial liberalization constructed by Kaminsky and Schmukler.[54] These data are described in more detail in Appendix Table II.[55]

The key relations between stock market development and internationalization of exchanges on one hand and country and international factors on the other hand can be shown using scatter plots. Figures 4 and 5 plot the market development and internationalization variables against some key explanatory variables. Figure 4 shows that there is in general a positive relation between the level of development (GDP per capita) and stock market activity. As expected, higher inflation rates depress stock market activity, although the effect seems to be non-linear as at low (very high) inflation rates, inflation seems to have relatively more (less) of a negative effect. The institutional variable—shareholder protection weighted by the degree of enforcement in the country—relates positively to the level of stock market development, as already documented by others. Trading costs (fees and commissions) are negatively correlated with stock market development, although the relation does not appear very strong.

The positive relation between stock market development and GDP per capita also extends to the degree of internationalization of exchange activity, that is the market capitalization of internationalized firms scaled by the size of the local market (Figure 5). Also when market capitalization is scaled by GDP (not depicted), it becomes clear that better developed countries have more internationalized firms as well as more trading and capital raised abroad relative to GDP. The relation between inflation rates and the degree

of internationalization is largely negative, although some countries with high inflation rates still have a relatively high degree of internationalization. The degree of shareholder protection also has a positive relation with the degree of internationalization, although the relation is not as strong as for stock market development. Finally, the costs of trading (fees and commissions) are positively correlated with the degree of internationalization, i.e., higher trading costs seem to drive stock exchange activities offshore, although the sample of countries for which we have trading costs is smaller.

These relations have been confirmed through more formal regression results, which, among others, control for the fact that some of the explanatory variables are related and country-specific effects.[56] To save space, we do not report the regression results here in detail, but rather discuss the main results, which are generally in line with the relations depicted above.[57] We find that the ratio of market capitalization to GDP is affected positively by GDP per capita and enforcement of laws (although not statistically significant), while inflation impedes stock market development. In addition, the simple index of shareholder rights and the degree of capital account liberalization and financial liberalization also positively affect stock market development. Perhaps surprisingly, trading costs domestically do not statistical significantly relate with stock market development. For trading domestically, we find it to be affected by the same variables that drive general stock market development. In particular, GDP per capita affects trading positively and inflation negatively (although not always statistically significantly). The degree of enforcement of laws is also positively and statistically significant related to value traded, but shareholder rights and capital account and financial liberalization are not statistically significant related to value traded, nor is the trading costs variable.

In terms of internationalization of exchange activity variables, the regression results for the ratio of market capitalization listed abroad to domestic market capitalization confirm that the degree of internationalization is influenced by some of the same factors that appear to determine general stock market development. In particular, in the basic regression, GDP per capita, inflation, and enforcement of laws (although not statistically significant) also drive the share of market capitalization listed abroad with the same sign. In addition, the degree of capital account and financial liberalization are positively, and statistically significant, related to the share of market capitalization listed abroad. Higher trading costs surprisingly do not seem to accelerate internationalization, but rather retard it. The ratio of value traded abroad to the value traded domestically also increases with the level of economic development. Inflation is less of a factor in influencing migration of trading, as is the degree to which laws are being enforced as these variables are not always statistically significant. And none of the other institutional variables except for the degree of financial liberalization are actually significant.

In general, the regression results confirm that the degree of internationalization is affected by the same variables that drive the development and activity of local stock market exchanges: higher income levels, greater macroeconomic stability, stronger legal systems, and greater financial and capital account liberalization. Since we defined the internationalization variables as ratios of international to domestic trading activity and domestic market capitalization, the findings imply that, as countries develop their fundamentals, they will experience an increase in international relative to domestic activity, even as domestic activity and market capitalization increase.

5. Conclusions

Powerful trends of internationalization and migration of order flow are putting pressures on stock exchanges around the world. For some exchanges, already more than half of trading and listing has migrated offshore. Our analysis suggests that the process of developing a local stock exchange also increases domestic firms' access to international exchanges. In particular, we show that, while better fundamentals lead to an increase in domestic activity, more and more of this activity will occur abroad as better fundamentals spur the degree of migration in capital raising, listing, and trading to exchanges abroad.

Other analyses we reviewed have shown that this migration has been beneficial in many ways. Corporations have been able to attract more easily funds at lower costs and better terms, and have tapped into wider investor bases. And investors have been able to acquire and sell shares at more liquid exchanges. At the same time, the migration of a major share of market capitalization and value traded abroad has had adverse consequences for the liquidity of the remaining companies' securities.

Migration also makes it more difficult for countries to sustain a fully-fledged local stock exchange. As trading volumes further decrease, financing the fixed overhead of maintaining market oversight, clearing, and settlement systems, among others, and generating enough order flow for local brokers and enough business for local investment banks, accounting firms, and other supporting services will become even harder, especially for smaller emerging markets. The trend towards increased migration will thus make it more difficult for small exchanges to survive (see also the contributions by Lee and Steil in this volume).[58] This is already reflected in the drive for mergers among

many developed countries, particularly in Europe. This consolidation of trading systems, spurred in part by technological advances, is not new. It occurred in the U.S. over the last 100 years: there were close to 200 stock exchanges in the U.S. at the start of the 20th century, but there are only about half a dozen today.[59] Surprisingly, stock exchanges in emerging economies have not yet participated in this trend, although they are possibly more at risk given their smaller size and worse legal and financial infrastructure. Clearly, however, pressures to do so will increase and, as technology advances, the ability to interlink trading systems to varying degrees remotely will increase.

The future of stock exchanges in many, especially emerging economies, is consequently not obvious. But, this does not mean that firms and investors will not have access to financial services. To the contrary, costs, terms, and liquidity can improve with increased migration to exchanges with better rules and greater transparency. Given the increased remote access to trading systems, domestic investors neither need to give up on their ability to trade stocks, even when they are listed abroad. The policy implication is that countries might be better off not focussing on developing full-fledged local stock exchanges, but rather concentrate on creating the conditions, such as improving shareholder rights and the quality of local legal systems, that allow corporations to issue and trade shares abroad efficiently. This facilitation will also need to involve the harmonization of corporate governance, accounting, listing and other rules with those in international financial centers, and in many environments the strengthening of securities markets' enforcement.

In addition, countries, especially those with small markets, should encourage that their local trading systems are linked tightly or merged with global markets. Furthermore, as Steil highlights, countries' governments should encourage foreign

trading systems and clearing and settlement operators to provide services locally, whether in collaboration with local institutions or on their own, and if necessary, remove any impediments against foreign participation.[60] Finally, to avoid domestic institutional investors being held captive to an increasingly illiquid and untransparent local market, portfolio restrictions that require investment in local instruments only should be avoided.

These conclusions should remain tentative, however, in part because we did not explore all possible determinants of the internationalization process. Furthermore, although we used data for individual firms, we only studied the process of internationalization at the aggregate level of a country. We did not investigate what types of firms were more likely to be internationalized; it might well be, for example, that the internationalization process to date has mainly involved larger corporations which already operate internationally going abroad. Casual evidence suggests this to be the case, although there has also been a flurry of new, innovative firms from emerging markets that have been able to secure financing abroad.[61]

Our analysis does, however, suggest that stock exchanges in emerging markets do not seem to have comparative advantage in offering capital raising, listing and trading services. Nevertheless, many medium-sized firms with local informational needs may not be able to go directly overseas. This may imply a need for some mechanism in each country to bring firms for the first time to a public market. This may not need to require a stock exchange, however, but rather an active market—in the form of venture capital firms, commercial banks, non-bank financial institutions, and institutional investors with links to international financial centers—for the financing of new and expanding firms. While we shed light on the internationalization side, more research is needed on what constitutes not only the minimum legal, but also institutional setup for such an active

first-stage financing industry, and whether or not that includes some form of a local market for public shares.

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Endnotes

[1] There are different alternatives to cross-list domestic stocks in international financial markets. A traditional way is to cross-list the share at another exchange. European companies use this method of internationalization most often. A very popular way to internationalize among emerging markets' firms during the 1990s is through depositary receipts, called American Depositary Receipts (ADRs) or Global Depositary Receipts (GDRs). These are foreign currency-denominated derivative instruments, issued by international banks like Bank of New York or Citibank, representing home securities held with a local custodian. DR programs grow or shrink depending on demand, since the issuance of DRs and the conversion back to the underlying shares only involve a small transaction cost. DRs trade in international markets. For example, U.S. dollar-denominated ADRs from Mexican companies trade at the New York Stock Exchange. A more recently introduced mechanism is the global registered share (GRS), used by large multinational firms; see Karolyi (2001) for an analysis of a recent case. Karolyi (1998) and Pulatkonak and Sofianos (1999) provide more details and a complete review of the options to list internationally.

[2] See Levine and Schmukler (2001).

[3] See Levine (1997) for an earlier review.

[4] King and Levine (1993).

[5] La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).

[6] Rajan and Zingales (1998).

[7] Beck, Demirguc-Kunt, Levine, and Maksimovic (2001).

[8] Henry (2000a) and (2000b).

[9] Bekaert, Harvey, and Llundblad (2001).

[10] Demirguc-Kunt and Levine (2001).

[11] Catalan, Impavido, and Musalem (2000).

[12] Claessens, Djankov, and Klingebiel (2001).

[13] Perotti and van Oijen (2000).

[14] See Levine and Zervos (1998).

[15] Domowitz, Glen, and Madhavan (2000a).

[16] Jain (2001)

[17] Pagano, Panetta, and Zingales, (1998).

[18] Subrahmanyam and Titman (1999).

[19] Domowitz, Glen, and Madhavan (2000b).

[20] Ljungqvist, Jenkinson, and Wilhelm (2000).

[21] Miller (1996) and Foerster and Karolyi (1999).

[22] Pulatkonak and Sofianos (1999).

[23] Pagano, Roell, and Zechner (1999).

[24] Sarkissan and Schill (2000).

[25] Hargis (2000).

[26] Moel, 2001.

[27] Reese and Weisbach (2000).

[28] Pagano, Panetta, and Zingales (2001).

[29] Doidge, Karolyi, and Stulz (2001).

[30] Miller and Puthenpurackal (2000).

[31] For an early review see Karolyi (1998). See also Karolyi and Stulz (2002) for a more general review of the literature on the pricing of assets internationally.

[32] Foerster and Karolyi (2000).

[33] Chaplinksy and Ramchand (2000).

[34] Lins, Strickland, and Zenner (2000).

[35] Schmukler and Vesperoni (2001a) and (2001b).

[36] Reese and Weisbach (2000).

[37] Baker, Nofsinger, and Weaver (1999).

[38] Doidge (2001).

[39] Karolyi (2001).

[40] Clayton, Jorgensen, and Kavajecz (1999).

[41] Schmiedel (2001).

[42] Domowitz and Steil (1999).

[43] Steil (2001).

[44] Using these data, we extrapolate the amount traded in December 2000 to obtain an estimate for the value traded abroad during 2000.

[45] Since we have only data for trading in ADRs, we cannot study whether differences in forms of internationalization (e.g., cross-listing, ADRs/GDR, versus global shares) matter for the liquidity.

[46] The use of both data sets help us, to some extent, cross check the data, obtain missing information, and correct reporting errors.

[47] As total market capitalization we use the market capitalization in the domestic market. This includes shares that are traded domestically and shares that are traded internationally through DRs. It does not capture the market capitalization of companies cross-listed in international stock exchanges (what is difficult to obtain), so our measure is an underestimate of the true total market capitalization.

[48] To save space, we do not report tables or figures with the numbers for different regions or countries. We just highlight some of the interesting results in the text.

[49] This reflects the two offsetting effects. While, on one hand, trading abroad has increased as a share of GDP, at the same time, trading domestically has increased even more, thus leading to a relative lower share. Of course, the sample of high-income countries includes in part the countries where the listing itself is actually taking place (the U.S. and the U.K., although these countries were not used in the subsequent section to explain the determinants of internationalization). The trend in developed countries is also affected by the data availability: while we have good data for the trading in ADRs and GDRs, the main vehicle used for internationalization by low-income and middle-income countries, we do not cover the trading in cross-listed stocks, a vehicle more typically used by high-income countries. As a result, we probably underestimate the internationalization trend for high-income countries.

[50] La Porta, Lopez-de-Silanes, and Shleifer (1998).

[51] Pistor, Raiser, and Gelfer (2000).

[52] The trading variable includes only direct commissions and fees. We also looked at the total costs of conducting a trade, that is, including price impact costs, but did not find very different relations.

[53] This measure has some drawbacks as the IMF revised the reporting format for capital account restrictions in 1996, when the IMF started to provide more details on aspects of capital account liberalization. Before 1996, the IMF measure of capital account liberalization is a simply dummy variable. As a consequence, we needed to splice the two series together to create a series of capital account freedom going back. We do this by using the year-by-year dummy measures up to 1995 and then create a single

liberalization dummy after 1996 if at least half of the detailed aspects covered by the IMF signaled liberalization.

[54] Kaminsky and Schmukler (2001).

[55] We should note here that, in addition to the variables already mentioned, we also used some other macroeconomic and institutional variables, including interest rate differentials, indexes on the degree of corruption, the quality of accounting standards, other measures of financial liberalization, and country data on capital flows in the form of bonds, equities, and foreign direct investment. Most of these variables were close proxies to the variables we did use (such as inflation in the case of interest rate differentials and corruption for the institutional variables); we generally obtained similar results, especially for the other institutional variables. We have not sufficient detail on the institutional market structure and trading systems in our sample of countries, including the degree of local competition among exchanges and trading systems, although Jain (2000) and others have found these variables to be important for market liquidity.

[56] See further Claessens, Klingebiel, and Schmukler (2002). Also Claessens, Klingebiel, and Schmukler (2001) study the relations between stock markets development and foreign direct investment and other capital flows.

[57] We used panel estimation employing fixed effects as well as random effects model. We applied generalized least squares estimates for the variables related to domestic market development. For the variables capturing internationalization, we estimated random effects tobit models. In the regression results, we did not consider the possible interrelations between some of the dependent variables (e.g., between trading and capital raising abroad) and time lags (e.g., privatization could stimulate new offerings domestically or enhance credibility leading to increased stock market development and

repeated offerings). As we ran panel regressions, we do not believe that our results are affected by the general bull period for new listings of the 1990s, as that period affected many countries similarly and our estimations shed light on the cross-country variation. Still, the regressions may suffer from the possible endogeneity of some variables, such as between the level of economic development and the size of the stock market, the growth of the economy and firms' external financing requirements, or between the level of trading costs and value traded. We did not try to adjust for endogeneity, in part because the results were generally robust to the estimation techniques employed and to the use of alternative specifications, including cross-section regressions for which the endogeneity problem is less likely to arise. However, it remains worth testing for potential endogeneity problems.

[58] Lee and Steil (2002).

[59] We like to thank our discussant for bringing this fact to our attention.

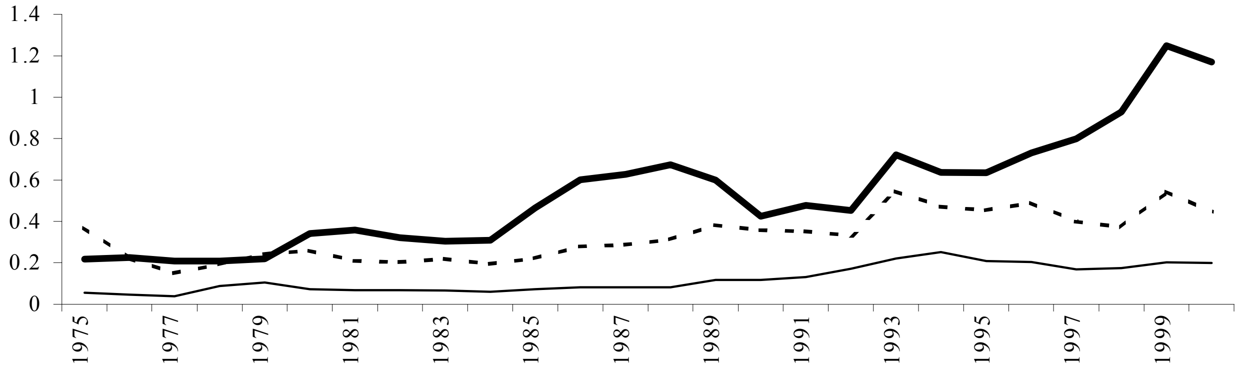
[60] Steil (2001).

[61] The most important firm-specific characteristic determining internationalization in terms of capital raising may have been whether or not it involved a privatization. Many of the privatizations in the 1990s of telecommunications and other state-owned enterprises were too large to be floated purely domestically and most involved large international tranches.

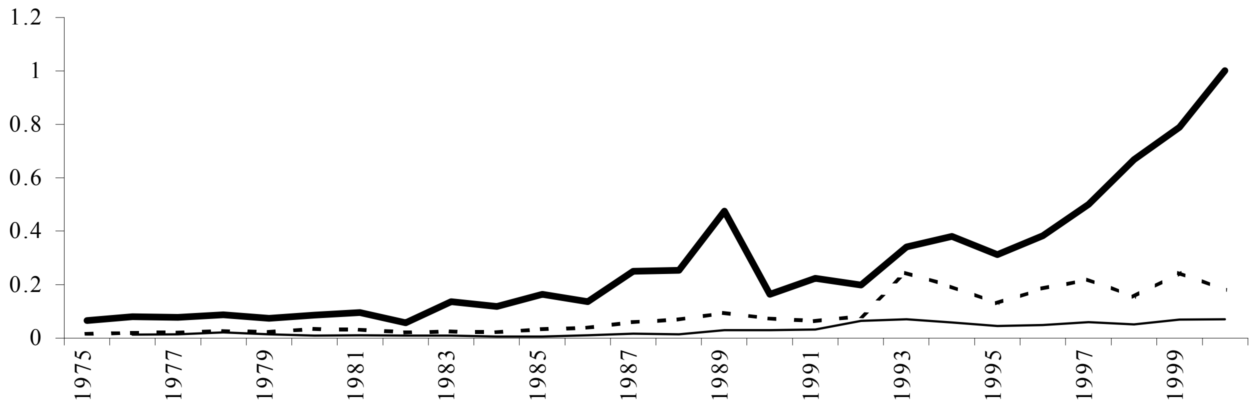
Figure 1
Stock Market Development

This figure shows the evolution over time of the ratio of market capitalization over GDP and the ratio of value traded domestically over GDP and over market capitalization. The series are aggregated across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The source is Standard & Poor's (former IFC) Emerging Markets Database.

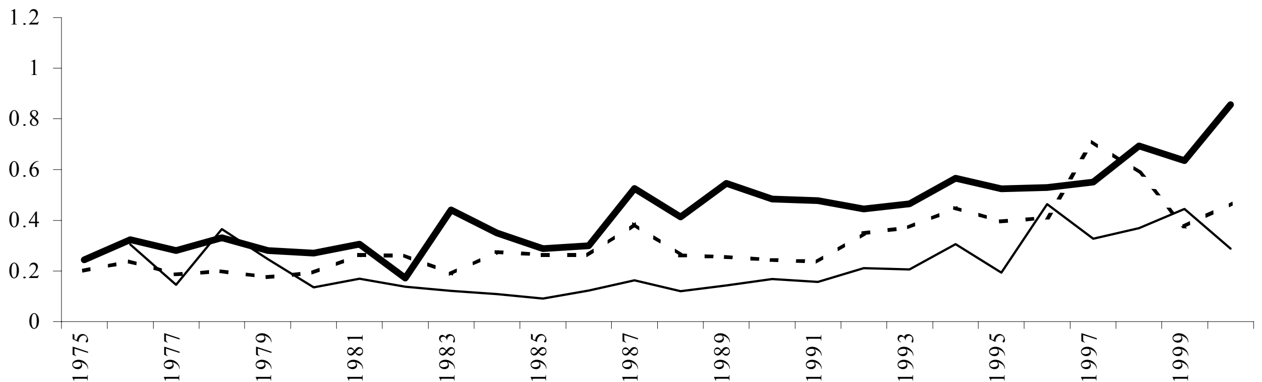
Market Capitalization / GDP



Value Traded Domestically / GDP



Value Traded Domestically / Market Capitalization



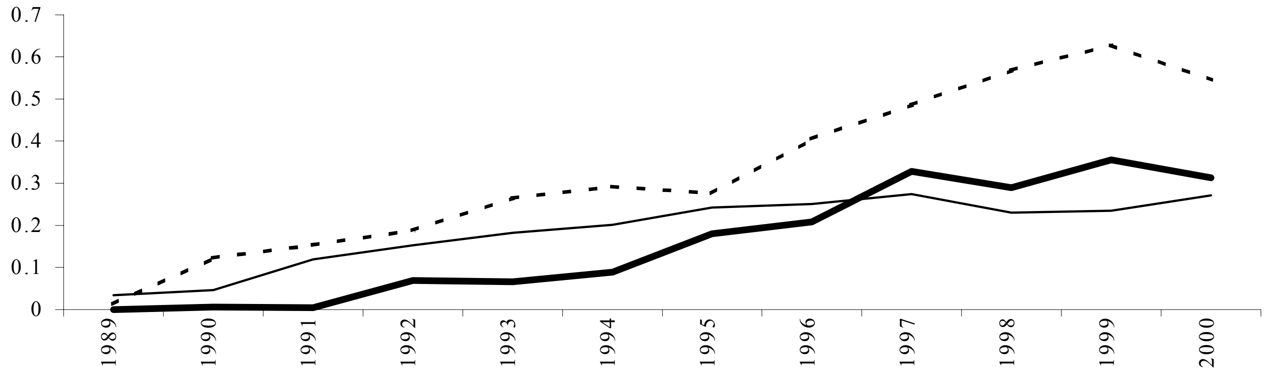
High-Income Countries   Middle-Income Countries   Low-Income Countries

Figure 2

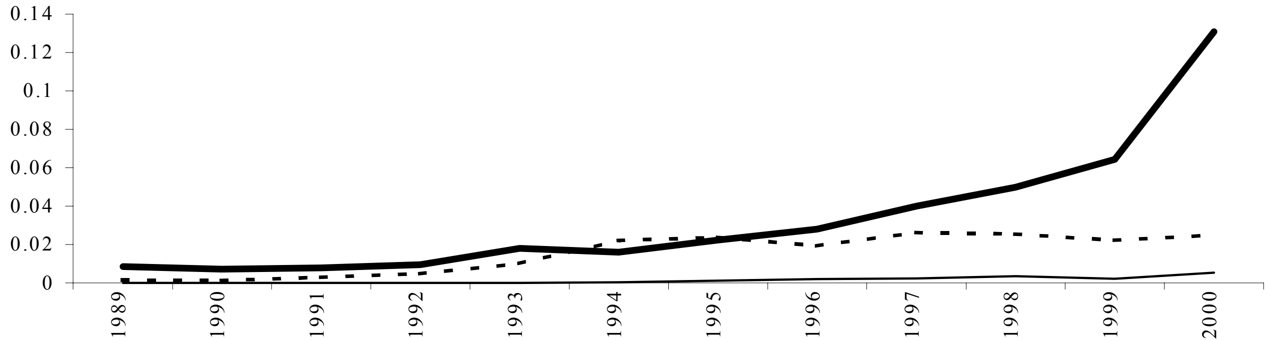
Internationalization of Stock Markets - Part A

This figure shows the evolution over time of the ratio of market capitalization of firms with international listings over total market capitalization and the ratio of value traded abroad over GDP and over total value traded domestically. The value traded abroad data are computed by aggregating firm-level data from Bank of New York. The series are averages across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The source is Bank of New York.

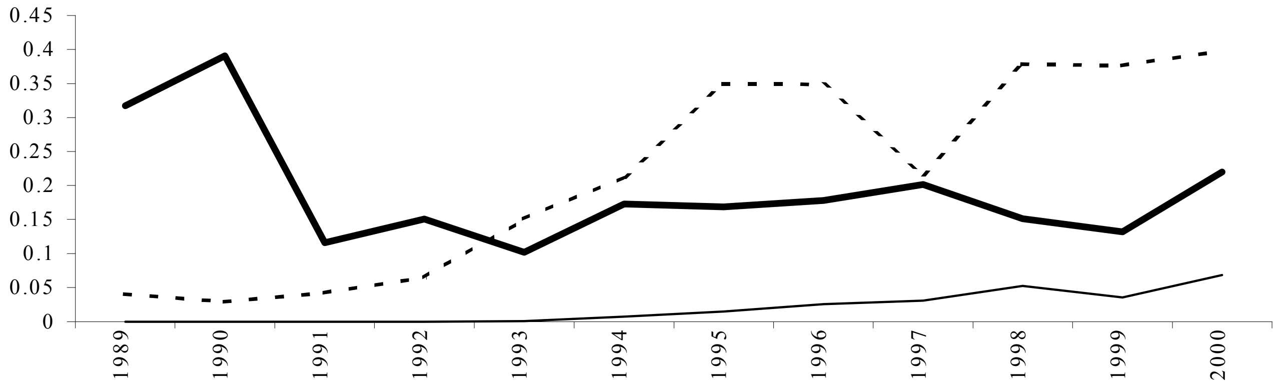
Market Capitalization of International Firms / Market Capitalization of All Firms



Value Traded Abroad / GDP



Value Traded Abroad / Value Traded Domestically



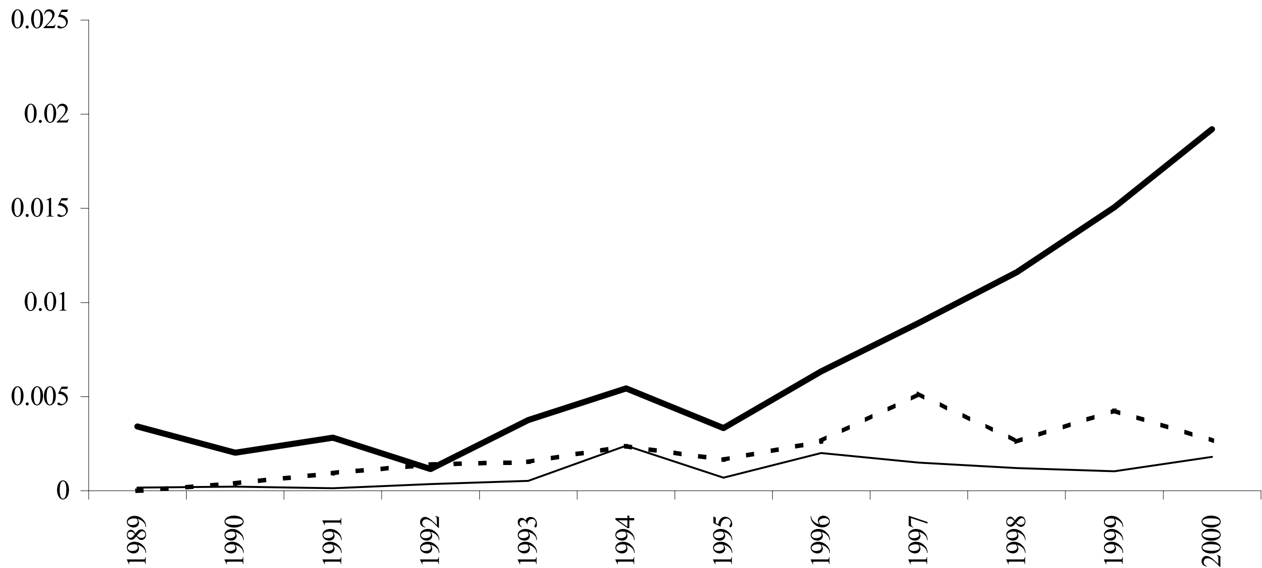
High-Income Countries   Middle-Income Countries   Low-Income Countries

Figure 3

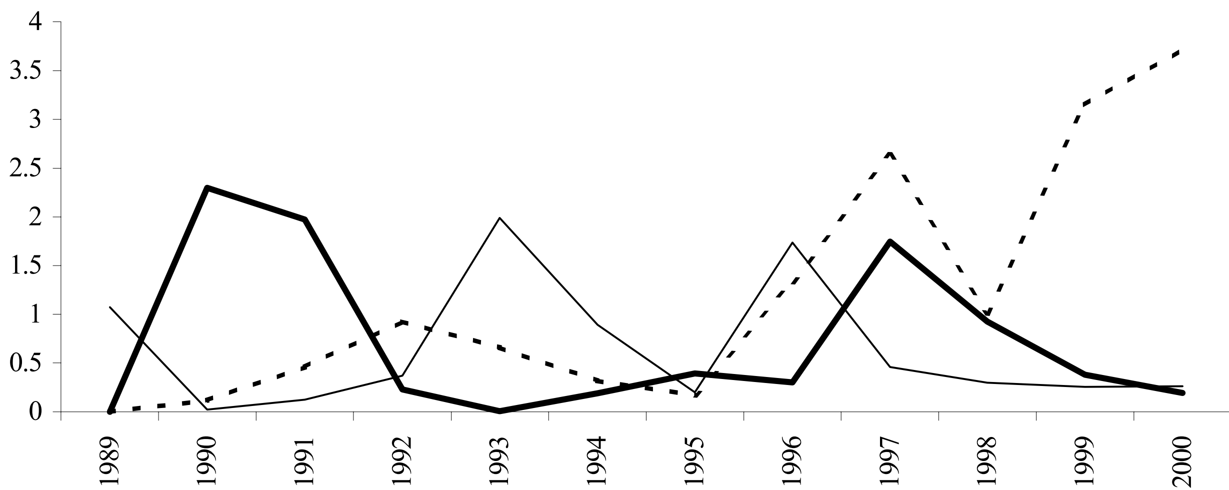
Internationalization of Stock Markets - Part B

This figure shows the evolution over time of the ratio of capital raised in international markets over GDP and over capital raised domestically. This capital raised in international markets is computed by aggregating firm-level data from Bank of New York and Euromoney. The series are averages across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The sources are Euromoney and Bank of New York.

Capital Raised Abroad / GDP



Capital Raised Abroad / Capital Raised Domestically



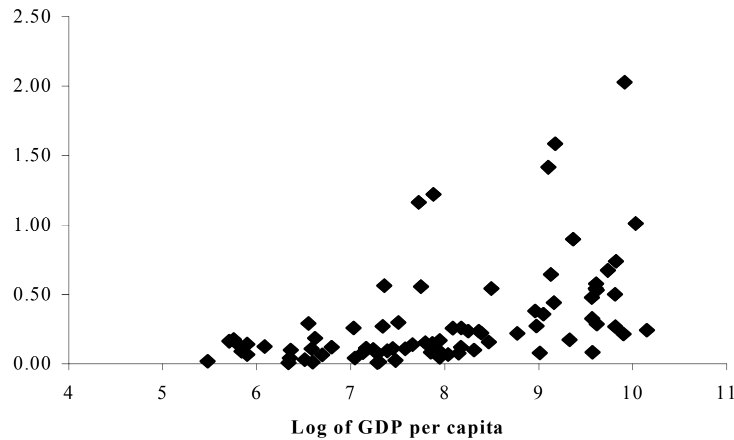
High-Income Countries Middle-Income Countries Low-Income Countries

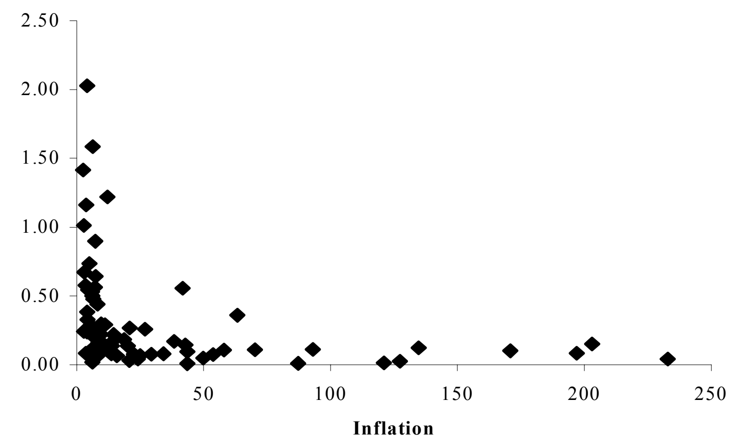
Figure 4

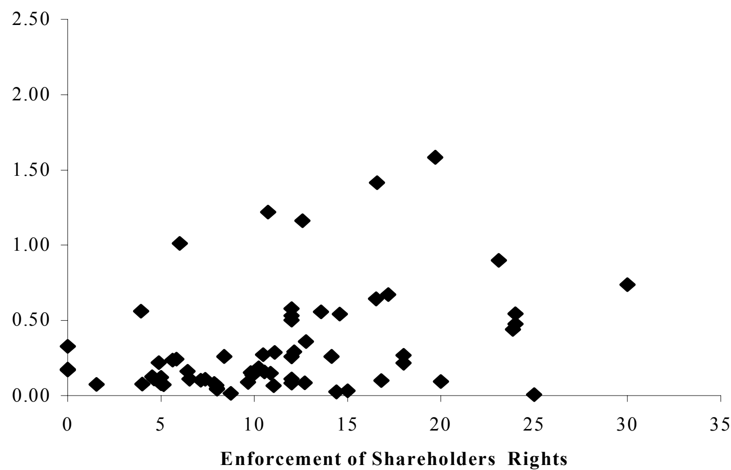
Scatter Plots - Stock Market Development

This figure shows the graphs of market capitalization over GDP (in the vertical axis) against log of GDP per capita, inflation (percentage per year), enforcement of shareholders rights, and trading costs - fees and commissions (in basis points), respectively. The data are averages by country overtime, with the available data in the period 1975 - 2000. The sources are Standard & Poor's (former IFC) Emerging Markets Database for data on market capitalization in domestic markets; World Development Indicators, World Bank, for GDP, GDP per capita, and inflation; La Porta et al. (1998), Pistor et al. (2000), and Country Risk Guide for enforcement of shareholders rights; Elkins/McSherry Co., Inc. for trading costs.

Market Capitalization / GDP







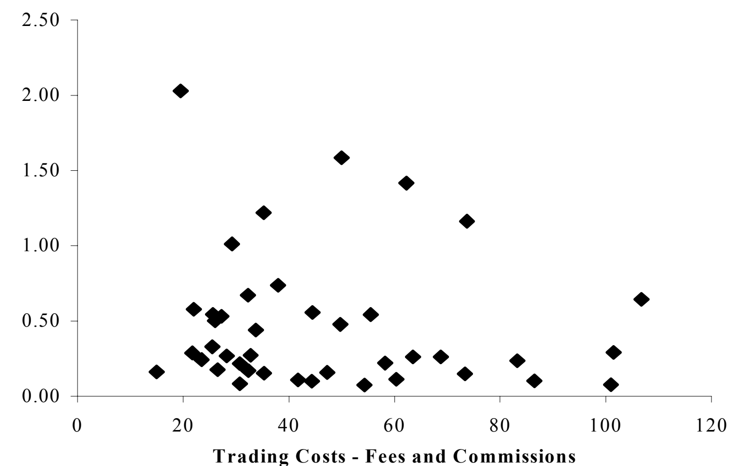
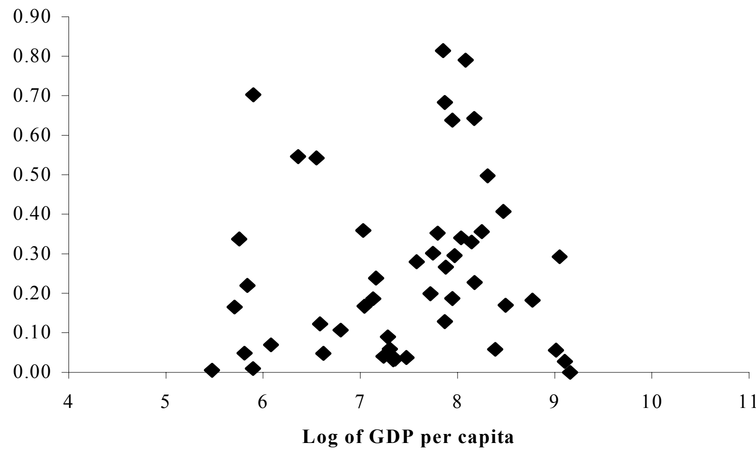


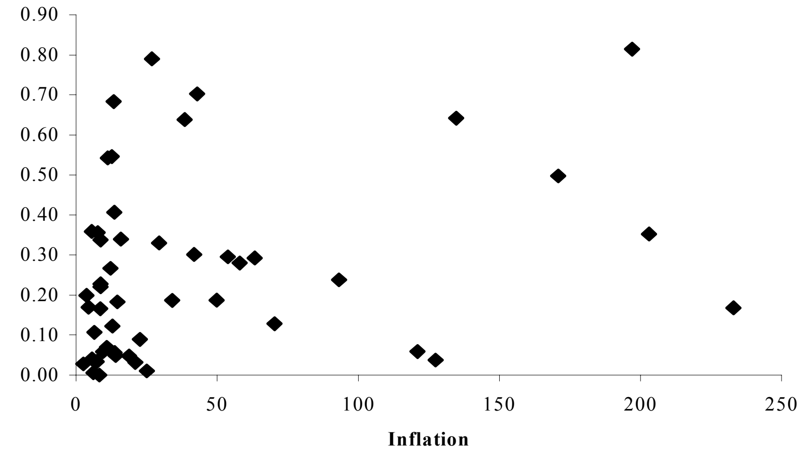
Figure 5

Scatter Plots - Internationalization of Stock Markets

This figure shows the graphs of market capitalization of international firms over total market capitalization (in the vertical axis) against log of GDP per capita, inflation (percentage per year), enforcement of shareholders rights, and trading costs - fees and commissions (in basis points), respectively. These variables are averages by country overtime, with the available data in the period 1975 - 2000. The sources are Standard & Poor's (former IFC) Emerging Markets Database for data on market capitalization in domestic markets; World Development Indicators, World Bank, for GDP, GDP per capita, and inflation; La Porta et al. (1998), Pistor et al. (2000), and Country Risk Guide for enforcement of shareholders rights; Elkins/McSherry Co., Inc. for trading costs.

Market Capitalization of International Firms / Total Market Capitalization





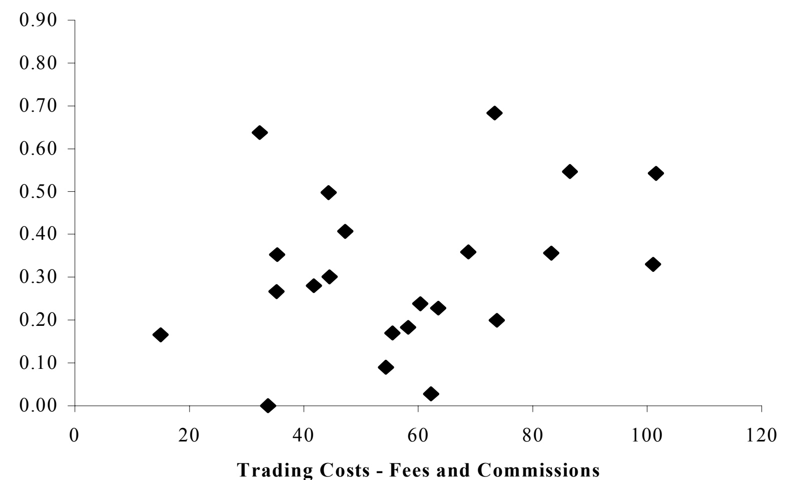


Table 1

Summary Statistics - Stock Market Development

This table shows the summary statistics of the ratio of market capitalization over GDP and the ratio of value traded domestically over GDP and over market capitalization at two points in time. The series are averages across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The source is Standard & Poor's (former IFC) Emerging Markets Databse.

	1990						2000					
	Market Capitalization / GDP						Market Capitalization / GDP					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	24	0.42	0.31	1.12	0.06	0.32	28	1.17	0.89	3.83	0.14	0.87
Middle-Income Countries	11	0.36	0.14	1.23	0.02	0.42	18	0.45	0.28	1.64	0.04	0.43
Low-Income Countries	18	0.12	0.06	0.50	0.01	0.13	30	0.20	0.13	0.70	0.00	0.18
Total	53	0.31	0.18	1.23	0.01	0.32	76	0.62	0.34	3.83	0.00	0.72
	Value Traded / GDP						Value Traded / GDP					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	23	0.16	0.11	0.55	0.01	0.17	28	1.00	0.66	3.20	0.03	0.94
Middle-Income Countries	11	0.07	0.04	0.30	0.00	0.10	18	0.18	0.08	0.88	0.01	0.26
Low-Income Countries	18	0.03	0.00	0.27	0.00	0.07	30	0.07	0.02	0.67	0.00	0.14
Total	52	0.10	0.04	0.55	0.00	0.14	76	0.44	0.09	3.20	0.00	0.73
	Value Traded / Market Capitalization						Value Traded / Market Capitalization					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	23	0.48	0.34	1.67	0.01	0.46	28	0.86	0.75	3.97	0.04	0.77
Middle-Income Countries	11	0.24	0.26	0.69	0.02	0.19	18	0.47	0.31	2.57	0.03	0.62
Low-Income Countries	18	0.17	0.06	0.96	0.01	0.25	27	0.29	0.14	1.49	0.02	0.37
Total	52	0.32	0.24	1.67	0.01	0.37	73	0.55	0.38	3.97	0.02	0.66

Table 2

Summary Statistics - Internationalization of Stock Markets - Part A

This table shows the summary statistics of the ratio of market capitalization of firms with international listings over the total market capitalization and the ratio of value traded abroad over GDP and over total value traded domestically at two points in time. The value traded abroad data are computed by aggregating firm-level data from Bank of New York. The series are averages across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The source is Bank of New York.

	1990						2000					
	Market Capitalization of International Firms / Total Market Capitalization						**Market Capitalization of International Firms / Total Market Capitalization**					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	1	0.01	0.01	0.01	0.01	.	6	0.31	0.37	0.58	0.03	0.22
Middle-Income Countries	8	0.12	0.03	0.61	0.00	0.21	15	0.55	0.62	1.00	0.04	0.26
Low-Income Countries	9	0.05	0.00	0.29	0.00	0.10	25	0.27	0.14	1.93	0.00	0.39
Total	18	0.08	0.00	0.61	0.00	0.16	46	0.37	0.33	1.93	0.00	0.35
	Value Traded Abroad / GDP						**Value Traded Abroad / GDP**					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	24	0.007	0.001	0.059	0.000	0.015	26	0.131	0.023	1.443	0.000	0.292
Middle-Income Countries	18	0.001	0.000	0.020	0.000	0.005	18	0.025	0.003	0.120	0.000	0.038
Low-Income Countries	32	0.000	0.000	0.000	0.000	0.000	24	0.005	0.000	0.040	0.000	0.012
Total	74	0.003	0.000	0.059	0.000	0.009	68	0.059	0.007	1.443	0.000	0.189
	Value Traded Abroad / Value Traded Domestically						**Value Traded Abroad / Value Traded Domestically**					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	21	0.391	0.003	7.464	0.000	1.622	26	0.220	0.033	2.438	0.000	0.510
Middle-Income Countries	11	0.029	0.000	0.271	0.000	0.082	18	0.398	0.003	2.177	0.000	0.706
Low-Income Countries	18	0.000	0.000	0.000	0.000	0.000	29	0.069	0.000	1.421	0.000	0.264
Total	50	0.170	0.000	7.464	0.000	1.054	73	0.204	0.009	2.438	0.000	0.502

Table 3

Summary Statistics - Internationalization of Stock Markets - Part B

This table shows the summary statistics of the ratio capital raised in international markets over GDP and over capital raised domestically at two points in time. This capital raised in international markets is computed by aggregating firm-level data from Bank of New York and Euromoney. The series are averages across countries grouped by income level, following the classification of the World Development Indicators, World Bank, see Appendix Table I. The sources are Euromoney and Bank of New York.

	1990						2000					
	Capital Raised Abroad / GDP						Capital Raised Abroad / GDP					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	26	0.0020	0.0007	0.0243	0.0000	0.0048	28	0.0192	0.0134	0.0746	0.0000	0.0190
Middle-Income Countries	18	0.0004	0.0000	0.0032	0.0000	0.0009	18	0.0027	0.0004	0.0158	0.0000	0.0045
Low-Income Countries	31	0.0002	0.0000	0.0051	0.0000	0.0009	25	0.0018	0.0000	0.0196	0.0000	0.0046
Total	75	0.0009	0.0000	0.0243	0.0000	0.0030	71	0.0089	0.0020	0.0746	0.0000	0.0149
	Capital Raised Abroad / Capital Raised Domestically						Capital Raised Abroad / Capital Raised Domestically					
	No. Obs.	Mean	Median	Max	Min	Std. Dev.	No. Obs.	Mean	Median	Max	Min	Std. Dev.
High-Income Countries	3	2.30	0.23	6.66	0.00	3.78	2	0.19	0.19	0.37	0.02	0.25
Middle-Income Countries	6	0.12	0.05	0.47	0.00	0.18	10	3.72	0.49	15.74	0.00	5.91
Low-Income Countries	7	0.02	0.00	0.12	0.00	0.05	14	0.26	0.00	2.19	0.00	0.62
Total	16	0.49	0.00	6.66	0.00	1.65	26	1.59	0.04	15.74	0.00	3.97

Appendix Table I
List of Countries by Income Level

This table shows the list of countries grouped by income level following the classification of the World Development Indicators, World Bank. The source is World Bank.

Low-Income Countries	Middle-Income Countries	High-Income Countries
Armenia	Argentina	Australia
Azerbaijan	Botswana	Austria
Bangladesh	Brazil	Belgium
Bulgaria	Chile	Britain
China	Croatia	Canada
Colombia	Czech Republic	Denmark
Cote D'Ivoire	Estonia	Finland
Ecuador	Hungary	France
Egypt	Korea	Germany
Ghana	Malaysia	Greece
India	Mauritius	Hong Kong
Indonesia	Mexico	Ireland
Iran Islamic Republic	Poland	Israel
Jamaica	Saudi Arabia	Italy
Jordan	Slovak Republic	Japan
Kazakhstan	South Africa	Luxembourg
Kenya	Trinidad and Tobago	Malta
Kyrgyz Republic	Turkey	Netherlands
Latvia	Venezuela	New Zealand
Lithuania		Norway
Macedonia		Portugal
Moldova		Singapore
Morocco		Slovenia
Nigeria		Spain
Pakistan		Sweden
Peru		Switzerland
Philippines		Taiwan
Romania		United States
Russia		
Sri Lanka		
Thailand		
Tunisia		
Ukraine		
Uzbekistan		
Zimbabwe		

Appendix Table II

Series Description and Data Sources

This table shows the description of the data used and their sources.

Series Names	Description	Source
Capital raised abroad (current U.S. dollars)	Capital raised in international markets through depository receipts or equity issues. The sample is based on two sources: Euromoney and Bank of New York. The first covers all operations of capital raised in international markets. The second covers capital raised through depository receipts. The series are based on Euromoney's information, augmented by depository receipts operations reported in Bank of New York and not included in Euromoney. The series cover capital raising operations since 1980.	Euromoney and Bank of New York
Capital raised domestically (current U.S. dollars)	Total value of public offerings and rights issues during the period, excluding stock dividends or bonus shares that do not raise cash.	Standard & Poor's (former IFC) Emerging Markets Database
Domestic market capitalization (current U.S. dollars)	Market capitalization in domestic stock markets.	Standard & Poor's (former IFC) Emerging Markets Database
Domestic market capitalization of international companies (current U.S. dollars)	Market capitalization of international companies at the end of the year. Series are computed in a firm-level basis, by adding, for each country-year, the market capitalization of all companies with international activity. Companies with international activity are those identified as having at least one active depository receipt program at any time in the year, or having raised capital in international markets in the current or previous years, or trading in London Stock Exchange.	Worldscope, Emerging Markets Database, and Bloomberg
Domestic value traded (current U.S. dollars)	Value traded in domestic stock market.	Standard & Poor's (former IFC) Emerging Markets Database
Value traded in depository receipts (current U.S. dollars)	Value traded in depository receipts covering the period 1989-2000. Series are computed in a firm-level basis by adding all tickers belonging to the same company on a yearly basis.	Bank of New York
GDP at market prices (current U.S. dollars)	Gross domestic product (GDP) at purchaser prices. GDP data is converted from domestic currencies using yearly official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.	World Bank: World Development Indicators
GDP per capita at market prices (current U.S. dollars)	Gross domestic product divided by midyear population.	World Bank: World Development Indicators
Inflation, consumer prices (percent per year)	Inflation as measured by the consumer price index.	World Bank: World Development Indicators

Law and order	Qualitative variable that ranges from 1 to 6, where higher numbers indicate higher "levels" of law and order. Law and order are assessed separately, with each sub-component comprising zero to three points. The law sub-component is an assessment of the strength and impartiality of the legal system, while the order sub-component is an assessment of popular observance of the law. Thus, a country can have a high rating in terms of its judicial system, for example 3, but a low rating, for example 1, if the law is ignored for a political aim, e.g. widespread strikes involving illegal practices. The data cover the period 1984-2000 for all countries, with the exception of Kyrgyz Rep., Macedonia, Mauritius, and Uzbekistan.	Political Risk Services: International Country Risk Guide.
Shareholders rights	Index aggregating shareholders rights that ranges from 0 to 6. The index is formed by adding 1 when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are nor required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles shareholders to call for an Extraordinary Shareholders' Meeting is 10 percent or less; (6) shareholders have pre-emptive rights when new shares are issued that can be waived only by a shareholder vote. The data cover the period 1990-1998 for all countries, with the exception of: Bangladesh, Botswana, China, Cote D'Ivoire, Ghana, Iran Islamic Rep., Jamaica, Luxembourg, Malta, Mauritius, Morocco, Saudi Arabia, Trinidad and Tobago, and Tunisia.	Pistor et al. (2000); La Porta et al. (1998)
Trading costs (basis points)	Trading costs covering fees and commissions, covering the period 1995 - 1998 for 41 countries.	Elkins/McSherry Co., Inc.
Financial Liberalization	Dummy that equals one on and after the year of capital account liberalization, and zero elsewhere. The data cover the period 1975 - 2000 for 28 countries.	Kaminsky and Schmukler (2001)
Capital account liberalization	Dummy that equals one on and after the year of capital account liberalization, and zero elsewhere. The data cover the period 1975 - 1995 for all countries.	IMF: Annual Report on Exchange Arrangements and Exchange Restrictions