Financial markets, and especially stock markets, have grown considerably in developed and developing countries over the past 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, 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 from emerging markets. Many firms from emerging economies now cross-list on international exchanges. Depository receipts (DRs), for example, are increasingly popular instruments.1 According to data provided by the Bank of New York, $533 billion

The authors would like to thank their discussant, Ken Kavajecz, and Andrew Karolyi, Benn Steil, Ruben Lee, and conference participants for very useful comments. They would like to thank Ying Lin, Francisco Vazquez, and especially Tatiana Didier for research assistance. For help with the data, they are grateful to Pamela Dottin, Monica Erpen, Dori Flanagan, Gregorio Impavido, Himmat Kalsi, Eung Kim, Angela Marshall, Alberto Musalem, Richard Webster-Smith, and Cheryl Workman. For financial support, they are grateful to the World Bank Latin American Regional Studies Program and Research Support Budget.

1. There are different alternatives for cross-listing domestic stocks in international financial markets. A traditional way is to cross-list the share at another exchange. European
in DRs were recorded on the New York Stock Exchange (NYSE) alone in 1999. And some $29 billion in new equity was raised through DRs in 2000 through 115 offerings in the U.S. and European markets, a 32 percent increase over 1999. Trading has also migrated abroad, and liquidity on some local stock exchanges has diminished. Trading in American depository receipts (ADR) amounted to almost $1.2 trillion in 2000, 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 be accessed from anywhere, with firms even having the ability to trade their stocks on both international and local exchanges. 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 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 both volume and income from trading activities risk declining.

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 about the emphasis that countries need to place on developing their own stock exchange as a means to ensure efficient mobilization and allocation of resources 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, companies use this method of internationalization most often. A very popular way to internationalize among emerging markets’ firms during the 1990s was through depository receipts, called American depository receipts (ADRs) or global depository 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 American depository receipts from Mexican companies trade on the New York Stock Exchange. A more recently introduced mechanism is the global registered share, 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.
and what factors drive their 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 base of investors? 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 of market capitalization and domestic trading for seventy-seven countries between 1975 and 2000. Using data on individual firms starting in 1983, we aggregate for each country and year individual capitalization, trading, and capital-raising figures of all international companies to obtain 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 the development of stock markets in general.

We find that a (small) number of fundamental factors 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 processes are complementary: as better fundamentals allow local markets to develop, firms will tend to access global exchanges. But there will be limits to the degree of local development associated with more offshore activity. Migration of a major share of market capitalization and value traded may have adverse consequences for the liquidity of remaining companies. 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 make it easier for firms to list in public markets, have their shares properly valued, and trade liquidly. Our results also imply that countries may not face a choice between local and international exchanges: improving fundamentals will lead to more activity, but most of this activity may go abroad as better fundamentals 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, creating tighter links or even merging with global exchanges may be necessary because not doing so will lead to a sure decline of the local market. This does not necessarily mean that there is no role 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. It begins with a review of the related literature, followed by a description of the data, some of the main trends in stock market development, and the degree of internationalization over time and across our sample of countries. It then reports on the factors that explain the trends in capitalization, listing, capital raising, and trading, both domestic and abroad. A final section concludes.

**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 from both the domestic and international sides. Some have been studied in several research strands. We discuss these strands briefly.

The determinants of financial sector development have become a much-researched area lately.\(^3\) King and Levine; La Porta and others; Rajan and Zingales; Beck and others; Henry; Bekaert, Harvey, and Lundblad;

\(^3\) See Levine (1997) for an earlier review.
Demirgüç-Kunt and Levine; and a number of others have analyzed the legal foundations of financial markets. They also have studied the relation of financial market development with macroeconomic variables, financial reform, and other country factors and the relations among 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 as well as other forms of finance in affecting growth, both at the aggregate level as well as 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 Organization for Economic Cooperation and Development (OECD) markets and for some emerging markets, studying twenty-six countries in total. They find that, apart from macro stability and legal rights, contractual savings institutions (pension funds and life insurance companies) positively affect stock market development and report evidence of a causal time-series relation between these institutions 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 their sample of countries. Perotti and van Oijen also study privatization and find an indirect positive relation between a program of privatization—through political risk reduction—and stock market development in a sample of thirty-one emerging economies.

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. 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 institutionally 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 by Domowitz, Glenn, and Madhavan. They document the relations among 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 recent increase in turnover 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.

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. Subrahmanyam and Titman extend this literature to a cross-country context by developing a model of the relation between the decision to go public and development of the local financial market. Empirically, Domowitz, Glenn, and Madhavan study the determinants of aggregate new offerings (domestic and abroad), covering both debt and equity on a cross-country basis. 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 development of the domestic bond market.

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. They find that

U.S.-style investment banking methods, when combined with U.S. banks and markets, lead to lower underpricing but not necessarily to lower costs for IPOs. Miller as well as Foerster and Karolyi empirically analyze the importance of broadening the base of investors as a motivation for the movement of foreign stock listing into the United States.\textsuperscript{15} Pulatkonak and Sofianos also study the determinants of listing in the United States.\textsuperscript{16} They find that time-zone distance from the United States, the level of trading costs, and whether the country is an emerging or a developed market explain a large fraction of the decision to list in New York. Pagano, Roell, and Zechner study the determinants of European firms listing abroad.\textsuperscript{17} They find that firms with high growth (potentials) and in high-tech industries are more likely to list in the United States, 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.\textsuperscript{18} 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.\textsuperscript{19} He shows theoretically 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.\textsuperscript{20}

Reese and Weisbach study the relation between cross-listing and the quality of the corporate governance framework in the home country of the firm.\textsuperscript{21} They find that the weaker is the framework at home, the more likely

\begin{itemize}
  \item Miller (1999); Foerster and Karolyi (1999).
  \item Pulatkonak and Sofianos (1999).
  \item Pagano, Roell, and Zechner (2002).
  \item Sarkissan and Schill (2001).
  \item Hargis (2000).
  \item Moel (2001).
  \item Reese and Weisbach (2000).
\end{itemize}
are firms to list abroad in an effort 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 because corporate governance rules are stronger abroad. Pagano, Roell, and Zechner find similar results for European corporations. 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. Miller and Puthenpurackal find that by raising bonds abroad (in the United States) corporations certify to act in the interest of investors and thus lower their borrowing costs and increase shareholders’ wealth.

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. Foerster and Karolyi study different forms of global equity offerings and their relations to long-term equity returns. Chaplinksy and Ramchand show that global offers are effective in expanding demand and reducing the price pressure effects associated with share issuance. 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 the sensitivity of new investment to internal cash flow is reduced. Schmukler and Vesperoni also find that domestic firms that participate in international markets obtain better financing opportunities and extend their debt maturity.

Reese and Weisbach also study the effects of cross-listing on subsequent equity offerings and find that offerings increase following cross-listing, especially from countries with less shareholder protection. Baker,

25. 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.
Nofsinger, and Weaver show that international cross-listings raise firm visibility, increasing analyst coverage and media attention.\textsuperscript{31} This, in turn, may lower the cost of capital, although they do not study this. Doidge shows that, following listing in the United States, foreign firms’ ownership becomes less concentrated, with reduced family and management control and more public ownership.\textsuperscript{32} Changes in ownership concentration may have implications for the degree of trading as the free float increases 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.\textsuperscript{33}

Lastly, our work relates to the analysis of the determinants, structure, and evolution of trading systems and the 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 of forming an exchange are the degree of economic freedom in the country, the size of its economy, the availability of technology, and the quality of its legal system.\textsuperscript{34} Schmiedel analyzes the technical efficiency of financial exchanges in Europe.\textsuperscript{35} He finds statistically significant inefficiencies, on the order of 20–25 percent, which can be explained, among others, by size of the exchange. Not meeting a minimum size for efficient provision of trading services, combined with increased cross-border flow of information and capital, thus may be a motivating factor for migration abroad and the trend toward consolidation of trading systems. Domowitz and Steil highlight the direct impact of a reduction in trading costs, as experienced in many markets, on turnover and the much more important indirect effects of a reduction in trading costs on the cost

\textsuperscript{31} Baker, Nofsinger, and Weaver (1999).
\textsuperscript{32} Doidge (2001).
\textsuperscript{33} Karolyi (2001).
\textsuperscript{34} Clayton, Jorgensen, and Kavajecz (1999).
\textsuperscript{35} Schmiedel (2001).
of equity.\textsuperscript{36} Steil analyzes the effects of technological advances on securities trading industries globally, with particular emphasis on the implications for developing countries.\textsuperscript{37} These last studies also discuss the global trends toward consolidation in trading systems and associated clearing and settlement systems, in part as responses to 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, no study 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, although 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.

\textbf{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.

\textit{Data Sources}

As noted, 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 these issues, we are interested in both the domestic and foreign dimension. It is not easy to get data and document these various trends, however, especially as we want to be as comprehensive as possible and cover as many countries and as long a times series as possible. Although several data sources on market capitalization and trading volumes 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 securi-

\textsuperscript{36} Domowitz and Steil (1999).
\textsuperscript{37} Steil (2001).
Table 1. List of Countries by Income Level

<table>
<thead>
<tr>
<th>Low-income countries</th>
<th>Middle-income countries</th>
<th>High-income countries</th>
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<td>Armenia</td>
<td>Argentina</td>
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<td>Azerbaijan</td>
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<td>Zimbabwe</td>
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Source: World Bank, World Development Indicators.
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<tr>
<th>Series names</th>
<th>Description</th>
<th>Source</th>
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<tbody>
<tr>
<td>Capital raised abroad (current U.S. dollars)</td>
<td>Capital raised in international markets through depository receipts or equity issues. The sample is based on two sources: <em>Euromoney</em> 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 <em>Euromoney</em>’s information, augmented by depository receipts operations reported in Bank of New York and not included in <em>Euromoney</em>. The series cover capital raising operations since 1980.</td>
<td><em>Euromoney</em> and Bank of New York</td>
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<tr>
<td>Capital raised domestically (current U.S. dollars)</td>
<td>Total value of public offerings and rights issues during the period, excluding stock dividends or bonus shares that do not raise cash.</td>
<td>Standard and Poor’s (former IFC)</td>
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<td>Domestic market capitalization (current U.S. dollars)</td>
<td>Market capitalization in domestic stock markets.</td>
<td>Emerging Markets Data Base</td>
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<tr>
<td>Domestic market capitalization of international companies (current U.S. dollars)</td>
<td>Market capitalization of international companies at the end of the year. Series are computed on 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 the London Stock Exchange.</td>
<td>Worldscope, Emerging Markets Data Base, and Bloomberg</td>
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<tr>
<td>Domestic value traded (current U.S. dollars)</td>
<td>Value traded in domestic stock market.</td>
<td>Emerging Markets Data Base</td>
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<tr>
<td>Value traded in depository receipts (current U.S. dollars)</td>
<td>Value traded in depository receipts covering the period 1989–2000. Series are computed on a firm-level basis by adding all tickers belonging to the same company on a yearly basis.</td>
<td>Bank of New York</td>
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<tr>
<td>GDP at market prices (current U.S. dollars)</td>
<td>Gross domestic product (GDP) at purchaser prices. GDP data are 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.</td>
<td>World Bank, <em>World Development Indicators</em></td>
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<tr>
<td>GDP per capita at market prices (current U.S. dollars)</td>
<td>Gross domestic product divided by midyear population.</td>
<td><em>World Development Indicators</em></td>
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<td>Variable</td>
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<tr>
<td>Inflation, consumer prices</td>
<td>Inflation as measured by the consumer price index.</td>
<td><em>World Development Indicators</em></td>
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<td>per year</td>
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<tr>
<td>Law and order</td>
<td>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 subcomponent is an assessment of the strength and impartiality of the legal system, while the order subcomponent 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, for example 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.</td>
<td><em>Political Risk Services; International Country Risk Guide.</em></td>
</tr>
<tr>
<td>Shareholder rights</td>
<td>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 not 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 preemptive rights when new shares are issued that can be waived only by a shareholder vote. The data cover the period 1990–98 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.</td>
<td><em>Pistor and others (2000); La Porta and others (1998)</em></td>
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<tr>
<td>Trading costs (basis points)</td>
<td>Trading costs covering fees and commissions, covering the period 1995–98 for 41 countries.</td>
<td><em>Elkins/McSherry</em></td>
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<tr>
<td>Financial liberalization</td>
<td>Dummy that equals 1 on and after the year of capital account liberalization and 0 elsewhere. The data cover the period 1975–2000 for 28 countries.</td>
<td><em>Kaminsky and Schmukler (2001)</em></td>
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<tr>
<td>Capital account liberalization</td>
<td>Dummy that equals 1 on and after the year of capital account liberalization and 0 elsewhere. The data cover the period 1975–95 for all countries.</td>
<td><em>IMF; Annual Report on Exchange Arrangements and Exchange Restrictions</em></td>
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</table>
named the Standard and Poor’s Emerging Markets Database. These data typically have 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 market 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 ignore any over-the-counter trading and trading in other markets. As such, they underestimate 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 and Poor’s Emerging Markets Database. The data set on domestic activity covers the period January 1975 to November 2000 for eighty-two countries, but the maximum number of countries that we analyze is seventy-seven due to the absence of data on other variables in five countries.

On foreign activity, we have data from Bank of New York, which cover the three major stock exchanges in the United States: 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 data sets 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 eighty 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, which are added to the list of firms with DR programs.

In terms of trading abroad, we focus on trading in DRs. One data set on DR value traded also comes from Bank of New York and covers the period from 1989 to November 2000.38 Companies that are not shown to

38. Using these data, we extrapolate the amount traded in December 2000 to obtain an estimate for the value traded abroad during 2000.
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 forty-five countries for the period January 1998 to 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.39

On capital raised abroad, we use a combination of two different data sets. One comes from Bank of New York, which covers capital raised through depository receipts for the period May 1980 to November 2000. It contains 1,178 operations from 864 firms in fifty-four countries. The other data set 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 eighty-six countries, covering the period January 1983 to April 2001. By combining these two data sets, we create a series on capital raised in foreign markets.40 Capital raised abroad, as we define it, thus refers to the sum of the amount of new equity financing that 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 categorization to study the degree of listing on international exchanges. In fact, this categorization 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

39. Since we have only data for trading in ADRs, we cannot study whether differences in forms of internationalization (for example, cross-listing—ADRs or GDRs—versus global shares) matter for the liquidity.

40. The use of both data sets helps us, to some extent, cross-check the data, obtain missing information, and correct reporting errors.
do not consider the degree to which domestic residents hold domestic shares in international markets.

**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), 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 3, 4, and 5 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 as well as domestic value traded both 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.

41. 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 depository receipts. It does not capture the market capitalization of companies cross-listed in international stock exchanges (which is difficult to obtain), so our measure underestimates the true total market capitalization.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1990</th>
<th></th>
<th>2000</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of observations</td>
<td>Mean</td>
<td>Median</td>
<td>Maximum</td>
</tr>
<tr>
<td>Ratio of market capitalization to GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>24</td>
<td>0.42</td>
<td>0.31</td>
<td>1.12</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>11</td>
<td>0.36</td>
<td>0.14</td>
<td>1.23</td>
</tr>
<tr>
<td>Low-income countries</td>
<td>18</td>
<td>0.12</td>
<td>0.06</td>
<td>0.50</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>0.31</td>
<td>0.18</td>
<td>1.23</td>
</tr>
<tr>
<td>Ratio of value traded to GDP</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>23</td>
<td>0.16</td>
<td>0.11</td>
<td>0.55</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>11</td>
<td>0.07</td>
<td>0.04</td>
<td>0.30</td>
</tr>
<tr>
<td>Low-income countries</td>
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<td>0.03</td>
<td>0.00</td>
<td>0.27</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>0.10</td>
<td>0.04</td>
<td>0.55</td>
</tr>
<tr>
<td>Ratio of value traded to market capitalization</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
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<td>0.48</td>
<td>0.34</td>
<td>1.67</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>11</td>
<td>0.24</td>
<td>0.26</td>
<td>0.69</td>
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<tr>
<td>Low-income countries</td>
<td>18</td>
<td>0.17</td>
<td>0.06</td>
<td>0.96</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>0.32</td>
<td>0.24</td>
<td>1.67</td>
</tr>
</tbody>
</table>

Source: Standard and Poor’s, Emerging Markets Data Base.

a. The series are averages across countries grouped by income level, following the classification of the World Bank, *World Development Indicators*, see table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1990</th>
<th></th>
<th>2000</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Mean</td>
<td>Median</td>
<td>Maximum</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>firms to total market capitalization</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>High-income countries</td>
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<td></td>
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<tr>
<td>Middle-income countries</td>
<td>8 0.12 0.03 0.61 0.00 0.21</td>
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<tr>
<td>Low-income countries</td>
<td>9 0.05 0.00 0.29 0.00 0.10</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>18 0.08 0.00 0.61 0.00 0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio of value traded abroad to GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>24 0.007 0.001 0.059 0.000 0.015</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Middle-income countries</td>
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<td></td>
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<tr>
<td>Low-income countries</td>
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<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>74 0.003 0.000 0.059 0.000 0.009</td>
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<td></td>
<td></td>
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<tr>
<td>Ratio of value traded abroad to value traded</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>domestically</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>21 0.391 0.003 7.464 0.000 1.622</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>11 0.029 0.000 0.271 0.000 0.082</td>
<td></td>
<td></td>
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<tr>
<td>Low-income countries</td>
<td>18 0.000 0.000 0.000 0.000 0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 0.170 0.000 7.464 0.000 1.054</td>
<td></td>
<td></td>
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</tbody>
</table>


a. The value traded abroad data are computed by aggregating firm-level data. The series are averages across countries grouped by income level, following the classification of the World Bank, World Development Indicators; see table 1.
### Table 5. Summary Statistics on Internationalization of Stock Markets—Part B, 1990 and 2000

<table>
<thead>
<tr>
<th>Variable</th>
<th>1990</th>
<th></th>
<th></th>
<th></th>
<th>2000</th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>Mean</td>
<td>Median</td>
<td>Maximum</td>
<td>Minimum</td>
<td>Standard</td>
<td>Mean</td>
<td>Median</td>
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<tr>
<td></td>
<td>observations</td>
<td></td>
<td></td>
<td></td>
<td>deviation</td>
<td>deviation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ratio of capital raised abroad to GDP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>26</td>
<td>0.0020</td>
<td>0.0007</td>
<td>0.0243</td>
<td>0.0000</td>
<td>0.0048</td>
<td></td>
<td></td>
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<tr>
<td>Middle-income countries</td>
<td>18</td>
<td>0.0004</td>
<td>0.0000</td>
<td>0.0032</td>
<td>0.0000</td>
<td>0.0009</td>
<td></td>
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<tr>
<td>Low-income countries</td>
<td>31</td>
<td>0.0002</td>
<td>0.0000</td>
<td>0.0051</td>
<td>0.0000</td>
<td>0.0009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>0.0009</td>
<td>0.0000</td>
<td>0.0243</td>
<td>0.0000</td>
<td>0.0030</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ratio of capital raised abroad to capital raised domestically</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-income countries</td>
<td>3</td>
<td>2.30</td>
<td>0.23</td>
<td>6.66</td>
<td>0.00</td>
<td>3.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>6</td>
<td>0.12</td>
<td>0.05</td>
<td>0.47</td>
<td>0.00</td>
<td>0.18</td>
<td></td>
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</tr>
<tr>
<td>Low-income countries</td>
<td>7</td>
<td>0.02</td>
<td>0.00</td>
<td>0.12</td>
<td>0.00</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>0.49</td>
<td>0.00</td>
<td>6.66</td>
<td>0.00</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Euromoney* and Bank of New York.

a. Capital raised in international markets is computed by aggregating firm-level data. The series are averages across countries grouped by income level, following the classification of the World Bank, *World Development Indicators*; see table 1.
Figure 1. Stock Market Development, 1975–2000

1. Ratio of market capitalization to GDP

2. Ratio of value traded domestically to GDP

3. Ratio of value traded domestically to market capitalization

Source: Standard and Poor's Emerging Markets Data Base.

a. The series are aggregated across countries grouped by income level, following the classification of the World Bank, World Development Indicators; see table 1.
Figure 2. Internationalization of Stock Markets—Part A, 1989–2000

Rates of market capitalization of international firms to market capitalization of all firms

Source: Bank of New York.

a. The value traded abroad data are computed by aggregating firm-level data. The series are averages across countries grouped by income level, following the classification of the World Bank, World Development Indicators; see table 1.
Figure 3. Internationalization of Stock Markets—Part B, 1989–2000

Source: Euromoney and Bank of New York.
a. Capital raised in international markets is computed by aggregating firm-level data. The series are averages across countries grouped by income level, following the classification of the World Bank, World Development Indicators; see table 1.

exchanges. Those figures differentiate trends by groups of countries according to income level.

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 3 shows that, for all countries combined, the ratio of market capitalization to GDP increased from a mean of 31 (median of 18) percent in 1990 to some 62 (median of 34) percent in 2000. This
increase in market capitalization reflects both generally higher prices for existing stocks as well as a larger number of listings. For high-income countries, for example, the average number of companies listed on a domestic exchange increased from 703 in 1990 to 900 in 1999. Taking a longer perspective, the relative increase in market capitalization was the most pronounced in high-income countries, with a sixfold 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 was a quadrupling in market capitalization, from 5 to 20 percent of GDP. In middle-income countries, however, market capitalization did not increase much, only from 37 to 45 percent of GDP. These countries lost out in the 1990s, increasing their market capitalization by only 8 percentage points, when stock markets in high-income countries grew on average by some 75 percentage points (table 1). Middle-income and low-income countries ended up with market capitalization in 2000 much below that of high-income countries, on average 70 and 100 percentage points less, respectively.

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 size 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. Among emerging markets, East Asian countries still have the largest markets relative to GDP, although they are growing at a slower pace relative to markets in transition economies and Latin American countries. Transition economies have seen fast growth in market capitalization, but from very low or nonexistent bases, and they still have the lowest average market capitalization of all groups. Following a period of rapid increase in the late 1980s, Latin America’s 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 GDP in our sample in 2000 was Hong Kong, with a stock market capitalization of 383 percent; the country with the lowest market capitalization was Bangladesh, with 2.5 percent.

42. 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.
Value traded as a ratio to GDP has grown strongly in the high-income group, with an almost twentyfold increase over the 1975–2000 period. Growth has been much less pronounced in the middle- and low-income group, with only a tenfold increase. The patterns of growth 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, delistings, 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 generally have 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 3). For all three groupings, value traded as a fraction of market capitalization has risen the fastest for the middle- and high-income countries, especially in the second half of the 1990s. Differences between countries remain large, however, with several 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 4 and 5. Figure 2 and table 4 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 5 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 among the three groups of countries.
The plot of the ratio of market capitalization listed abroad to total market capitalization shows clearly how strong the trend toward internationalization 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 31 (median 37) percent for high-income countries, 55 (median 62) percent for middle-income countries, and 27 (median 14) percent for low-income countries. With almost 96 percent in 2000, Israel had the highest ratio of foreign to total market capitalization. Here too, considerable regional differences are evident. In 2000 Eastern Europe had the highest ratio of market capitalization listed abroad, with 49 percent, followed by East Asia, with 37 percent, and Latin America, with 33 percent. Firms listed abroad accounted for just 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 because larger companies typically list abroad, but the growth in numbers has been large. For middle-income countries, the average number of companies listed abroad increased from three in 1990 to twenty-five in 2000. Low-income countries had, on average, eighteen companies listed abroad in 2000. With more companies listing abroad, high-income countries experienced the highest increase, on average, in terms of numbers. Although, on average, only thirty-five 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 past 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 trading at 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 and 20 percent. 43

43. This reflects 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
In terms of capital raised abroad, the trend toward internationalization in the past few years is 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. Since some of the high-income countries are financial centers in their own right, it is not surprising that capital raised abroad exceeded the amount of capital raised domestically 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 2 percent of GDP, as trading itself was only a small ratio to GDP, but it amounted to 40 percent of domestic trading in 2000. This is similar to 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.

**Explaining the Trends in Stock Market Development and Migration**

We try to explain stock market development and the trends toward 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 shareholder rights, as reported by La Porta and others and by Pistor, Raiser, and Gelfer. We also use a variable related to the trading system in the country, namely trading commissions and trading fees. Finally, for ease of foreign ownership in the stock market, we use the measure of capital account liberalization reported by the IMF and the index of financial liberalization constructed by Kaminsky and Schmukler. These data are described in more detail in table 2.

The key relations between stock market development and internationalization of exchanges, on the 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

44. La Porta and others (1998); Pistor, Raiser, and Gelfer (2000).
45. The trading variable includes only direct commissions and fees. We also looked at the total costs of conducting a trade—that is, including the costs of price impact—but did not find very different relations.
46. This measure has some drawbacks, as the IMF revised the reporting format for capital account restrictions in 1996, when it started to provide more details on aspects of capital account liberalization. Before 1996, the IMF measure of capital account liberalization is simply a dummy variable. As a consequence, we needed to splice the two series together to create a series of capital account freedom going back in time. We do this by using the year-by-year dummy measures up to 1995 and then creating a single liberalization dummy after 1996 if at least half of the detailed aspects covered by the IMF signaled liberalization. Kaminsky and Schmukler (2001).
47. 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 in the case of institutional variables); we generally obtained similar results, especially for the other institutional variables. We do not have 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 (2001) and others have found these variables to be important for market liquidity.
Figure 4. Scatter Plots for Stock Market Development, 1975–2000

Market capitalization / GDP

Log of GDP per capita

(continued)
Figure 4. Scatter Plots for Stock Market Development, 1975–2000 (continued)

Market capitalization / GDP

Market capitalization / GDP

Source: Standard and Poor’s Emerging Markets Data Base for data on market capitalization in domestic markets; World Bank, World Development Indicators, for GDP, GDP per capita, and inflation; La Porta and others (1998), Pistor and others (2000), and Political Risk Services, International Country Risk Guide for enforcement of shareholder rights; Elkins/McSherry for trading costs.

a. The data are averages by country over time, with the available data in the period 1975–2000.
Figure 5. Scatter Plots for Internationalization of Stock Markets, 1975–2000

Market capitalization of international firms / total market capitalization

Log of GDP per capita

Market capitalization of international firms / total market capitalization

Enforcement of shareholder rights

(continued)
Figure 5. Scatter Plots for Internationalization of Stock Markets, 1975–2000
(continued)

Market capitalization of international firms / total market capitalization

![Scatter Plot 1](image1)

Inflation (percent per year)

Market capitalization of international firms / total market capitalization

![Scatter Plot 2](image2)

Trading costs—fees and commissions (basis points)

Source: Bank of New York; Euromoney; and sources cited in figure 4.
a. Data are averages by country over time.
stock market activity. As expected, higher inflation rates depress stock market activity, although the effect seems to be nonlinear because an increase in inflation seems to have relatively more of a negative effect at low inflation rates and relatively less of a negative effect at very high inflation rates. The institutional variable—shareholder protection weighted by the degree of enforcement in the country—relates positively to the level of stock market development, as 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, that is, 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 for country-specific effects.\footnote{See Claessens, Klingebiel, and Schmukler (2002). Also, Claessens, Klingebiel, and Schmukler (2001) study the relations between stock market development and foreign direct investment and other capital flows.} To save space, we do not report the regression results in detail, but rather discuss the main results, which are generally in line with the relations depicted above.\footnote{We used panel estimation employing fixed effects as well as a 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 (for example, between trading and capital raising abroad) and time lags (for example, privatization could stimulate new offerings domest-
find that the ratio of market capitalization to GDP is affected positively by GDP per capita and enforcement of laws (although not statistically significantly), 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 surprising, trading costs domestically do not statistically significantly relate to stock market development. We find trading domestically to be affected by the same variables that drive general stock market development. In particular, GDP per capita affects trading positively and inflation affects trading 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 significantly related to value traded, nor is the variable trading costs.

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 related positively, and statistically significantly, 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 the 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 is 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.

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 the access of domestic firms to international exchanges. In particular, we show that, although 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 better able to attract 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 may have had adverse consequences for the liquidity of the remaining companies’ securities.

Migration also makes it more difficult for countries to sustain a full-fledged local stock exchange. As trading volumes 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 harder, especially for smaller emerging markets. The trend toward increased migration will thus make it more difficult for small exchanges to survive (see also the contributions by Lee and Steil in this volume). 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 United States over the past 100 years: there were close to 200 stock exchanges in the United States at the start of the twentieth century, but there are only about half a dozen today. Stock exchanges in emerging economies have not yet participated in this trend, although they are possibly more at risk given their smaller size and weak legal and financial infrastructure. Clearly, however, pressures to do so will increase and, as technology advances, the ability to interlink trading systems remotely to varying degrees will increase.

The future of stock exchanges in many, especially emerging, economies is 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 that have better rules and greater transparency. Given the improved remote access to trading systems, domestic investors do not have 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 focusing on developing full-fledged local stock exchanges, but should instead 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 need to involve the harmonization of corporate governance, accounting, listing, and other rules with those in international financial centers, and in many environments it also will need to involve strengthening the enforcement of securities markets.

In addition, countries, especially those with small markets, should encourage their local trading systems to be linked tightly or merged with global markets. Furthermore, as Steil highlights, 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, to remove any impediments against...
foreign participation. 52 Finally, to avoid domestic institutional investors being held captive to an increasingly illiquid and opaque local market, portfolio restrictions that require investment only in local instruments should be avoided.

These conclusions 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 the migration abroad of larger corporations that already operated internationally. Casual evidence suggests this to be the case, although a flurry of new, innovative firms from emerging markets also have been able to secure financing abroad. 53

Our analysis does, however, suggest that stock exchanges in emerging markets may not have comparative advantage in offering capital raising, listing, and trading services. Nevertheless, many medium-size 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, nonbank 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 the institutional setup for such an active first-stage financing industry and on whether or not that includes some form of a local market for public shares.

53. The most important firm-specific characteristic determining internationalization 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.
Comment and Discussion

Comment by Ken Kavajecz: The key result of the paper is that the same factors leading to a country’s stock market development are also leading to the migration of stock markets overseas. This is a very important result that I have not seen anywhere else, and the authors draw a number of policy implications from it. Their recommendation to emerging market countries is to concentrate on promoting fundamentals rather than setting up and promoting stock market development since the stock market is going to migrate overseas anyway. Instead, the authors argue that emerging market countries should facilitate the integration of their trading systems with the more developed markets. In my discussion, I address five points.

First, endogeneity and causality are difficult to determine. This is a criticism of the literature, not of the paper per se. I took these two lines from the paper: “Financial markets tend to develop as income per capita grows,” and “the liquidity of the stock market has been found to be a useful predictor of future economic growth.” We really cannot say that the financial market is driving gross domestic product (GDP) or that GDP is driving the financial market. We have to be realistic and acknowledge that they are driving each other. Again, this is by no means an attack on the paper; rather, it is a comment on the entire set of papers in this literature.

Second, are the results driven partially by the sample period or by the particular countries involved? To what extent are the results driven by the bull market of the 1990s? It would be easy to issue an American depositary receipt (ADR) when people are willing to buy anything. I wonder whether these results would be mitigated somewhat if the authors investigated different periods?
Do the results change when you eliminate the United States and the United Kingdom from the sample? It is easy to think about foreign trading (an ADR, for example) and domestic trading when you are talking about a small emerging market country. But I am not sure what it means to have foreign trading for the developed countries like the United States. Furthermore, the data set must have many firms from the United States, United Kingdom, Germany, and so forth. I am curious to see how the results would change, if at all, if the United States and United Kingdom were eliminated from the sample.

Third, I would expand the set of explanatory variables. I agree with the use of every one of their variables. Since much of this research is exploratory, I would encourage the authors to investigate alternative variables further. The index of economic freedom ranks countries based on a number of specific criteria, for example, development of the banking sector, fiscal policy, and taxes. Alternative law and order variables, such as political risk or governmental bureaucracy, may generate different results.\textsuperscript{1} Measures of accounting standards are also likely to be important. All of these would be good variables to explore.

I was not surprised that the trading cost variable failed to be significant, given that the vast majority of it appears to be commissions and fees. I do not think of commissions and fees as having anything to do with a stock market or a stock exchange. Commissions and fees are largely payments to brokers. That is not the business of an exchange. The business of an exchange, as I see it, is to provide liquidity. How well an exchange does its job is best measured by the bid-ask spread, quoted depth, and price impact variables. Those sorts of things should be included in a trading cost variable for a stock market or stock exchange.

Fourth, I do not see how we can necessarily say that emerging market countries should abandon their domestic exchanges and let trading migrate overseas. First of all, I want to make a distinction between markets and exchanges. Most of the paper discusses markets. The authors are talking about the market in Argentina or the market in Spain. A significant portion of the countries of the world that have an exchange have more than one, so what we really should be doing is breaking this down by exchange. If you want to know how exchanges are going to work, address exchanges directly.

\textsuperscript{1} See Henisz (2000) for a country ranking.
I agree that good fundamentals should be promoted. We absolutely need to have these emerging market countries enhance their GDP growth and keep inflation in check. But I disagree that the results suggest that they should shy away from listing and trading securities locally. This decision depends on many things, like an exchange’s structure, size, and competitors. None of these issues is discussed in the paper, and we should not advocate a policy of facilitating the migration of stock markets overseas without first addressing them.

I find it interesting that the paper ignores political risk. I have a hard time thinking about an emerging market country that would say, “We don’t need to have a stock exchange; we’ll just go to some other country to trade.” If, at some point in the future, relations with that particular country become strained, their capacity to raise or trade capital is gone. That is an incredibly high cost that is not monetized anywhere in this analysis.

Fifth, I want to offer some perspective concerning the role of exchanges in emerging markets. I think of an exchange as an entity that provides liquidity. Successful exchanges differentiate their service from that of their competitors. There are many examples of exchanges that differentiate themselves. For example, the New York Stock Exchange (NYSE) has the ability to work an order on the floor. The separate roles of the London Stock Exchange and the Paris Bourse allow traders to submit limit orders on the Paris Bourse, collect large inventory positions, and then go to the London Stock Exchange and cross a large block. Electronic communication networks tout speed of execution. I see no reason why emerging markets cannot do the same thing.

What service could exchanges in emerging markets be providing? I want to take you back to the U.S. Gold Rush. Literally, the ‘49ers ran out to the western United States, dug a hole, found a piece of gold, incorporated the land, and set up an exchange right next door to trade the security. There was an incredible amount of speculation at the time. In 1865, at the end of the Civil War, there were twenty-one U.S. equity exchanges. In 1900, at the turn of the century, there were more than 200, and in 1934, after the Securities and Exchange Commission Act, only forty-nine remained. Many well-established exchanges, like the NYSE, were already in operation over this period. Why were they not trading these companies? The answer is “Because they had a reputation to uphold.”

They did not want to trade companies that they did not know anything about.

During this time period, the role of the exchanges in the western United States was to supply liquidity to market participants, given that the more traditional exchanges could not or would not do so. In retrospect, these exchanges, through the price discovery process, identified the firms that would remain going concerns from those that were merely a passing concern.

How relevant is this for today? I see a striking parallel between the western exchanges of the Gold Rush and the exchanges in emerging market countries. Without both of them, we forgo the benefits of the price discovery process for identifying innovative firms.

Discussion: Michael Pomerleano strongly encouraged the authors to distinguish foreign-owned from domestic-owned firms in their analysis. He also was troubled by the policy implication that emerging market countries are best off letting their stock exchange activities migrate overseas. At a minimum, governments in these countries are likely to be reluctant for reasons of nationalism to accept that their national stock exchange may have no future. In addition, if a country has no capital market of its own, that may mean that no more than the top three or four enterprises in the country would be able to go public at all; the others would not be sufficiently large or profitable to be listed on world exchanges.

Ruben Lee agreed with Pomerleano and pointed out that there is evidence that only local investors purchase smaller stocks. He also believed, however, that there is a need to do more study of appropriate sequencing, regionalization, and mergers in developing capital markets in emerging market countries.

Kim Staking suggested that the authors’ prescription to allow migration to occur and smaller exchanges to disappear be accepted. However, he stated that medium-size firms should be helped by developing the environment that allows them to access international exchanges in the future, by strengthening corporate governance, accounting standards, and the rule of law, and by eliminating taxation on securities market transactions.

Lee also brought up an unresolved paradox that the authors raised—the more a country develops, the worse off it is in terms of stock markets. He was skeptical about the claims in the literature that trading fees are not important in determining migration of trading to other locations. Frank
Edwards questioned the use of measures that he felt gauged market valuation instead of measuring the capital-raising contribution of equity markets or of liquidity positions. He believed that the authors’ results showed that fees are not important because they used market capitalization and did not use a turnover variable. He gave the example of the United States in the 1990s, when there was tremendous increase in market valuation relative to gross national product concurrent with a falling portion of external funds raised by equity. Hence market capitalization is not a good proxy even for the capital-raising contribution, and the authors should perhaps use a flow of funds variable: dollars raised minus equity retrieved relative to gross national product.

Claessens defended the use of market capitalization because it is very difficult at the cross-country level to get good data on flow of funds. He stated that, in addition to capital raising, other aspects of well-developed stock markets—resource allocation, monitoring, discipline, and corporate governance—also are important. Moreover, the authors did use the volume of capital raised in their regressions as a dependent variable. He also noted that the variable they used for trading fees led to similar results when, as well as fees and taxes, it also included the price impact effect. Pomerleano agreed with both, saying that, while the authors were justified in using market capitalization to gross domestic product, this approach was deceptive, especially in cases like China and Malaysia. He suggested that the authors explore the virtuous cycle of capital mobilizations and use turnover to market capitalization instead of turnover to gross domestic product.

Jim Angel felt that the regressions in the paper basically identified the conditions for good economic growth, where companies in a growing country need capital and go abroad when they cannot obtain it at home. He commented that the barriers involved in trading depository receipts—the creation, breakage, and arbitrage process—are one of the reasons why trading migrates outside of the home country. Giving the example of DaimlerChrysler, he noted that trading naturally concentrates in the place where the individual security is most liquid, and hence one way to keep more of the trading in the home market is to establish more global shares.

Angel also believed that exchanges always will have some kind of a role inside the local jurisdiction since securities are fundamentally legal instruments dependent on their founding regime to define and enforce them. He conceded that the local exchange might be nothing more than a virtual
entity that has outsourced its information technology and its clearing offshore. Kim Staking agreed, saying that, although the trading flows to international markets are important, legal and regulatory functions remain local.

Staking suggested that the authors try to measure where price formation has taken place. He said that for large firms price formation sometimes occurs in New York because these are international firms, whereas the information available for price formation for smaller firms is available only locally.

Claessens said he and his colleagues would like to study more micro-based evidence using individual firm data to see how migration varies by type and size of firm and by industry sector. He believed that this exercise probably would show that large firms inevitably migrate to international liquidity pools. He did not think that local markets are unimportant; rather, he felt that high standards are necessary for local stock markets to succeed, and many countries would not be able to meet these standards. In addition, an organized market is not necessary to provide all kinds of financial services, and not all countries need to follow a set model and satisfy standards of the International Organization of Securities Commissions.

Finally, Claessens believed that the sample period is an important variable since the bull market perhaps disproportionately helped emerging market companies to access international markets. However, he was skeptical that there would be a lot more trading in emerging market stocks relative to trading in general due to the bull market alone.
References


