

Stock market development and internationalization: Do economic fundamentals spur both similarly? ☆

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Abstract

We study how local stock market development and internationalization—listing, trading, and capital raising in international exchanges—are related to economic fundamentals. Using panel data, we find that higher-income economies with sounder macro policies, more efficient legal systems, greater openness, and higher growth opportunities have more developed local markets. Importantly, these fundamentals also relate to internationalization, and actually more so, since the better the fundamentals, the higher the ratio of internationalization to local market activity. Furthermore, we find that greater domestic stock market development is associated with subsequent higher internationalization. These findings are not consistent with firms internationalizing to escape poor domestic environments, but rather with better country fundamentals allowing firms to internationalize and with countries with more developed stock markets experiencing more internationalization. With liquidity agglomeration, better fundamentals might further

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accelerate internationalization, with potential negative effects on domestic markets, as others have already argued.

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1. Introduction

Financial markets, especially stock markets, have grown considerably in developed and developing countries over the last two decades. Several factors have aided in their growth, importantly, improved macroeconomic fundamentals, such as monetary stability and higher economic growth. General economic and capital market specific reforms, including privatization of state-owned enterprises, financial liberalization, the establishment of stock exchanges and bond markets, and an improved institutional framework for investors, have further encouraged capital market development.

Financial 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 in countries around the world. An important element of the globalization trend has been the increase in the stock exchange activities that take place abroad, most notably for emerging markets, but also for developed countries. Many firms now cross-list on international exchanges, with depositary receipts being a particularly popular instrument to access international markets.¹ Going forward, many expect these globalization trends to continue as access to information improves, standards (concerning corporate governance, listing, accounting, and others) become more harmonized, technology advances, and inter-market linkages further increase.

In this paper, we try to shed light on how economic fundamentals affect the processes of domestic stock market development and internationalization of stock exchange activities. We do this by analyzing a basic question: how do the macroeconomic and institutional factors that drive the development of local stock markets affect the internationalization process? Many papers have analyzed the factors influencing stock market development. More recently, a number of papers have also studied the factors driving internationalization. However, papers have studied these processes separately, working with different methodologies and samples, making comparisons difficult. In this paper, we use the same framework to analyze how economic fundamentals affect both domestic stock market development and the internationalization of stock market activities (listing, capital raising, and trading abroad) for a large panel of countries and years, thereby facilitating comparisons between the factors driving the two processes.

How economic fundamentals affect domestic stock market development and the internationalization of stock market activities is not obvious. At least two possible views exist on

¹ There are different ways to “list” domestic stocks in international financial markets. A traditional way is to cross-list the share in another exchange. European companies tend to use this method of internationalization most often. A very popular way to internationalize among emerging market firms has been through depositary receipts, called American Depositary Receipts (ADRs) or Global Depositary Receipts (GDRs). These are instruments issued by international banks, like Bank of New York or Citibank, representing a claim on the 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. See Levy-Yeyati et al. (2006).

the relation between economic fundamentals and domestic stock market development and internationalization.

One view is that better institutional and macroeconomic environments spur more developed domestic stock markets, and therefore reduce the need and desire to use international markets. The first part of this view is uncontroversial, as much evidence exists on the positive link between fundamentals and financial market development.² The second part is behind a number of recent papers on internationalization. According to this view, poor domestic environments prompt firms and investors to use international markets more intensively. An unfavorable domestic environment has long been considered one of the main reasons for capital flight and greater use by domestic residents of all types of financial services offered internationally (see, for example, [Collier et al., 2000](#)). This may also apply to the services offered by stock markets. [Karolyi \(2004\)](#), for example, argues that the growth of American Depositary Receipt (ADR) programs in emerging economies is the consequence of badly functioning stock markets, resulting from economic, political, legal, or other institutional forces that create incentives for firms to leave. Moreover, the literature on “bonding” argues that international markets are more attractive to firms from countries with weak institutional environments since they offer them the ability to “bond” themselves to a system that better protects investors’ rights (see [Benos and Weisbach, 2004](#), for a review of this literature).³ Thus, poor domestic environments are associated with worse domestic market development, but greater use of international markets. Conversely, improvements in fundamentals help develop domestic markets, but reduce the use of international markets.

A second view considers that better domestic environments increase the attractiveness of assets to investors. Markets in general will offer larger amounts of external financing, higher liquidity, and a lower cost of capital when a firm’s host country fundamentals improve. Under this view, macroeconomic and institutional factors determine the willingness of domestic and international markets to provide financing to firms. Investors in international markets, with the ability to invest globally, may reward more a better environment than investors in domestic markets.⁴ Provided that there is access to international markets, better domestic fundamentals will, under this view, lead to more (not less) use of international capital markets.

The second view thus differs from the first one. Under the first view, any firm regardless of its domestic environment can choose to go abroad and in doing so can escape, at least in part, the poor domestic environment. Under the second view, however, only firms from good environments are able to go abroad, as the suppliers of capital grant them access to international markets at attractive enough terms.

² The foundations of financial markets and the relation between financial market development and macroeconomic variables, financial reform, and other country factors have been extensively documented. The general finding is that financial markets tend to develop as income per capita grows, financial reform progresses, and the institutional environment improves. See [Levine \(1997\)](#) for an earlier review and [Levine \(2005\)](#) for a recent update.

³ One of the first papers in this literature is [Coffee \(1999\)](#), who argues that cross-listing in an exchange with better investor protection is a form of bonding, creating a credible and binding commitment by the issuer to protect the interests of minority shareholders. [Reese and Weisbach \(2002\)](#) find that, after cross-listing in the U.S., firms from countries with a weaker corporate governance framework are more likely to issue consecutively equity at home. They argue that this is because cross-listing improves investor protection for all shareholders, including those outside the U.S. There are, however, skeptics of the bonding view. [Licht \(2003\)](#) and [Siegel \(2005\)](#), for example, argue that the host regulators typically provide only limited protection against minority rights abuses by controlling shareholders in the firm’s home country, and thus the value from bonding is reduced.

⁴ Several authors argue that integration with global financial markets increases market discipline, reducing the government’s ability to expropriate investors and conduct unsound policies, as international investors can easily shift their capital across countries (see, for example, [Obstfeld, 1998](#); [Stulz, 2005](#); [The Economist, 2001](#)).

In sum, while there are arguments for both a positive and negative impact on internationalization of an improvement in those fundamentals that positively affect local market development, empirical tests can help us disentangle which view is best supported by the data. Doing so requires a formal analysis of the determinants of both stock market development and internationalization. We conduct this analysis for a large panel dataset, comprising 78 countries and using a relatively long time series, from 1984 to 2000. We start by documenting the patterns in domestic market capitalization, trading, and capital raising for high-, middle-, and low-income countries. Using individual firm data, we calculate similar measures of the level of internationalization and document these for each country grouping. We then formally analyze the factors driving domestic stock market development and internationalization, measured in each case by market capitalization, trading activity, and capital raising.

Our results show that there are a (small) number of fundamental factors that affect both the development of local stock markets and the degree of international activity. We also find that generally these fundamentals affect local markets and international activity in the same way, i.e., as a country's macroeconomic and institutional environment improves, domestic stock exchange activity increases, but so does activity abroad. Moreover, we find that improvements in country fundamentals tend to have a greater impact on the internationalization process, i.e., internationalization accelerates as fundamentals improve. We also show that countries with more developed domestic stock markets see relatively more (subsequent) internationalization of stock market activities.

Regarding the two views on the role of fundamentals, the findings that the processes of local stock market development and internationalization are driven by the same factors and that these processes are positively related are not consistent with the arguments that explain internationalization as the result of a poor domestic environment. The evidence rather supports the view that access to international markets depends to a greater extent on investors' assessment of the firms' home country environment, and less so on the decision of firms to escape countries with poor environments by going abroad.

The paper is structured as follows. Section 2 provides a description of the data and illustrates some of the main trends in stock market development and internationalization over time and across our sample of countries. Section 3 describes the basic econometric tests and results. Section 4 presents some robustness tests and extensions. Section 5 concludes.

2. Data and descriptive analysis

This section describes the data used in the paper. As some of these data are unique and new, we first discuss in detail the data sources. Second, we present some general trends and summary statistics of the variables under study.

2.1. Data sources

We are interested in the domestic and international dimensions of stock market activity. As measures of stock market activity, we use three variables: market capitalization, value traded, and amount of new equity capital raised. For all, we need data on both domestic and international activity. Getting data for these various measures is not easy, however, especially as we want to be as comprehensive as possible, covering as many countries and as long a times series as possible. While there are several data sources on market capitalization and trading that comprise a large number of countries, there is no comprehensive database on the degree of new capital raised

domestically. There are even less comprehensive data available on the degree to which securities are listed and traded abroad and the degree of capital raising in foreign markets. We therefore need to combine a number of sources.⁵

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.⁶ The dataset on these domestic activity measures comprises the period 1975–2000 for 82 countries, but due to data availability on the explanatory variables, our sample is restricted to 78 countries covering the period 1984–2000. The amount of equity capital raised by domestic firms in the local stock market comes from the World Federation of Exchanges and covers the period 1982–2000 for 43 countries.

On foreign activity, we have data from the Bank of New York, which cover the three major stock exchanges in the U.S.: AMEX, NASDAQ, and the New York Stock Exchange (NYSE). The base list of companies with depositary receipt (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. 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 1951 active DR programs from 1524 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 the Bank of New York, which lists all terminated DR programs. The set of terminated DR programs relevant for our study amounts to 214 firms. We augment the foreign activity information with data from NASDAQ and NYSE. The data on foreign corporations listed on those exchanges give us practically all the stocks that cross-listed or otherwise accessed the U.S. equity markets over this period.

In terms of trading abroad, we focus on trading in DRs. The dataset on DR value traded also comes from Bank of New York and covers the period January 1989–November 2000, providing the value traded in U.S. dollars in New York.⁷ 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. However, given that the time span of the LSE data is much more limited, we focus our analysis of trading on the Bank of New York data.⁸

Capital raised abroad, as we define it, 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. On capital raised abroad, we use a combination of two different datasets. One comes from the Bank of New York, which covers capital raised through depositary receipts for the period May 1980–November 2000. It contains 1178 operations from 864 firms in 54 countries. The other dataset covers all capital raising operations in international markets by firms and is

⁵ The list of countries covered and the groupings by income level are provided in Appendix Table 1, while the data sources are detailed in Appendix Table 2.

⁶ While this data source is the best available for a large cross-section of countries, it only covers listing and trading in the major formal, organized public stock exchange in a country and ignores any over-the-counter trading and activity in other markets. As such, it underestimates a country's total market activity.

⁷ Using these data, we extrapolate the amount traded in December 2000 to obtain an estimate for the value traded abroad during all of 2000.

⁸ Since we only have data for trading in DRs, we cannot study whether differences in the forms of internationalization (e.g., cross-listing, ADRs/GDRs, global shares) matter for liquidity.

compiled by Euromoney. This database provides a more comprehensive account of capital raised, because it includes both DR programs and cross-border listings. It reports 8795 operations from 5665 firms in 86 countries, covering the period January 1983–April 2001. The use of both datasets also helps us to cross-check the data, obtain missing information, and correct reporting errors. By combining these two datasets, we create a series on capital raised in foreign markets.

The data from Bank of New York, Euromoney, LSE, NASDAQ, and NYSE allow us to construct a list of “international” firms for each country. Under our definition, international firms are those that list in international markets, directly or via DRs, or raise capital in international equity markets. With this classification we determine the market capitalization of all international firms for each country, which we use as one measure of the degree of internationalization at the country level.⁹ This measure does not indicate, however, whether the shares of these firms are actively traded in international markets. For some cross-listed stocks, for example, trading is largely in the home market rather than abroad. Also, some stocks might have little free float available for outside investors, as they are closely held. Both facts may lead to an overestimation of the degree of internationalization when using market capitalization. The other measures of the degree of internationalization (trading and capital raised abroad) do not suffer from these potential problems, since they quantify the actual activity that takes place in international markets.

2.2. Descriptive statistics

Based on the data compiled, we calculate nine variables for analysis, three for the development of local stock exchanges, three for the internationalization of stock exchanges, and three for the relative degree of internationalization. The first three are: market capitalization over gross domestic product (GDP), value traded domestically over GDP, and capital raised domestically over GDP. The next three are: market capitalization of international firms over GDP, value traded abroad over GDP, and capital raised abroad over GDP. The last three are: market capitalization of international firms over total domestic market capitalization, value traded abroad over value traded domestically, and capital raised abroad over capital raised domestically. In all cases we work with annual data, using end-of-year stock data and flow data cumulative over the year.¹⁰

Figs. 1, 2 and 3 display average values of the nine variables under study, divided by income groups for the years 1990 and 2000. Appendix Tables 3, 4, and 5 provide more detailed descriptive statistics of all the variables.¹¹ Fig. 1 shows that, for all income groups, the ratio of market capitalization to GDP increased over this period, with the largest increase occurring in high-income countries. While also experiencing sharp increases, middle- and low-income countries still ended up with market capitalization in 2000 much below that of high-income countries, on average 74 and 95 percentage points less, respectively. The increase in market capitalization reflected both generally higher prices for existing stocks as well as an increased

⁹ In our definition, we do not consider the degree to which foreign investors hold shares traded in local markets as an indication of internationalization. It would be almost impossible to construct such a series because many countries do not distinguish between local and foreign investors in the domestic market and/or do not disclose this information. Similarly, we do not consider to what degree domestic residents hold domestic shares in international markets.

¹⁰ Note that all our variables are expressed in U.S. dollars. However, our results are indifferent to the use of this numeraire as we use ratios that make the currency denomination irrelevant.

¹¹ Note that the maximum number of countries used to construct the figures and tables is 76, due to some missing observations in the years selected.

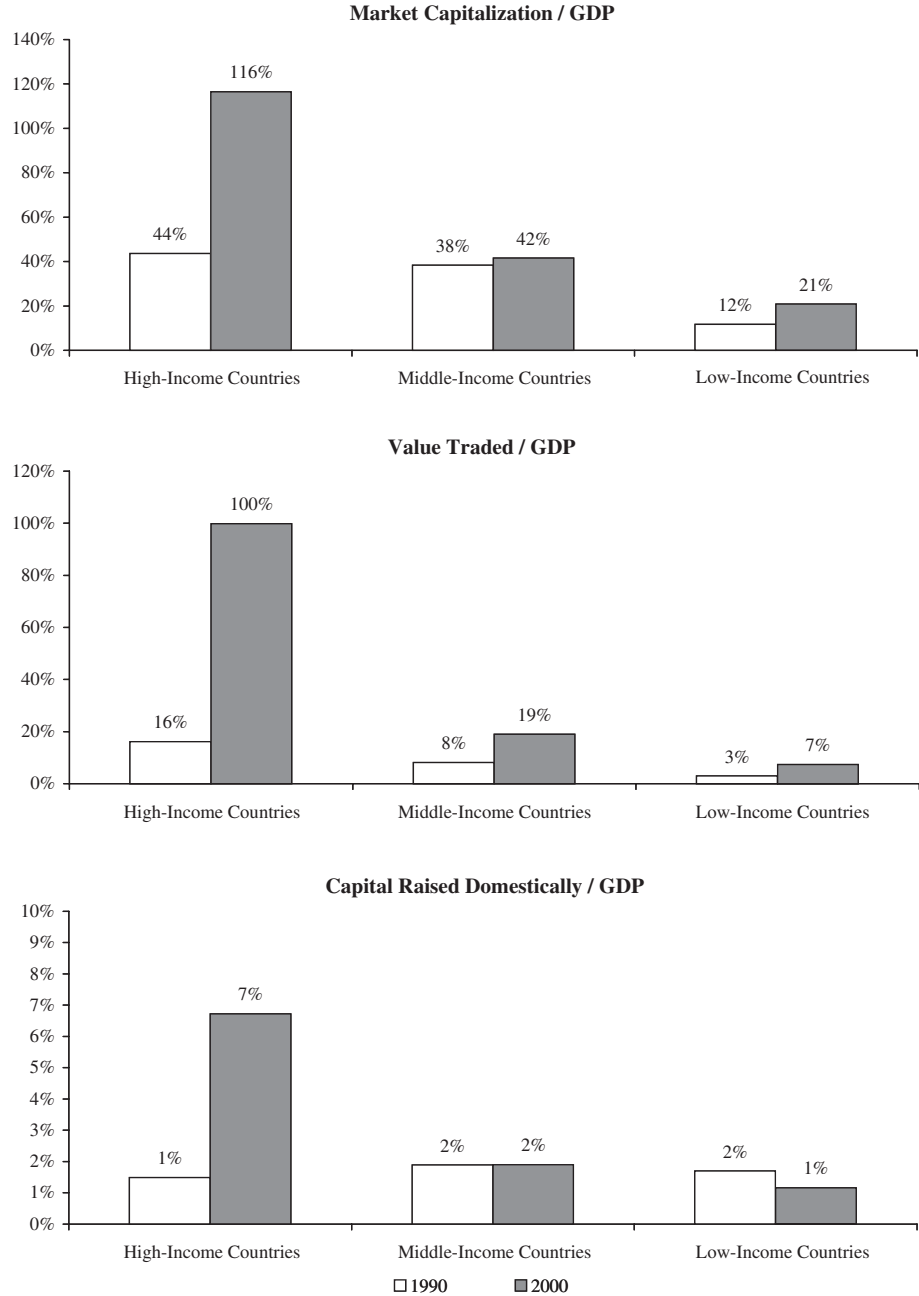


Fig. 1. Stock market development. This figure shows market capitalization over GDP, value traded domestically over GDP, and capital raised domestically over GDP at two points in time. The series are averages across countries, grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). The sources are Standard & Poor's (former IFC) Emerging Markets Database for market capitalization and value traded domestically and World Federation of Exchanges for capital raised domestically.

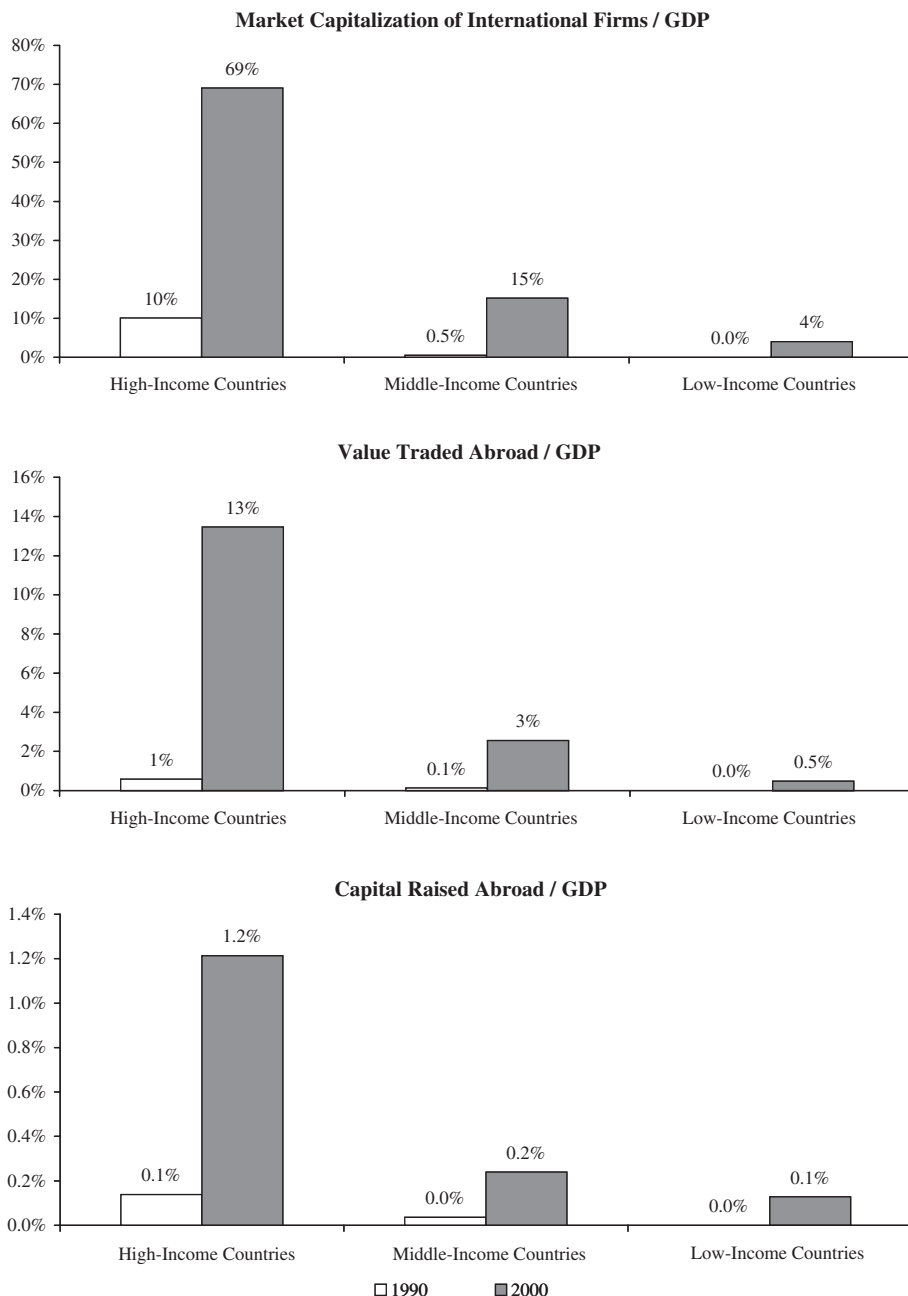


Fig. 2. Internationalization of stock markets relative to GDP. This figure shows market capitalization of international firms over GDP, value traded abroad over GDP, and capital raised abroad over GDP at two points in time. The series are averages across countries, grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). Market capitalization of international firms is computed by aggregating firm level data from Standard & Poor's (former IFC) Emerging Markets Database, Worldscope, and Bloomberg. Value traded abroad is computed by aggregating firm level data from Bank of New York. Capital raised abroad is computed by aggregating firm level data from Bank of New York and Euromoney.

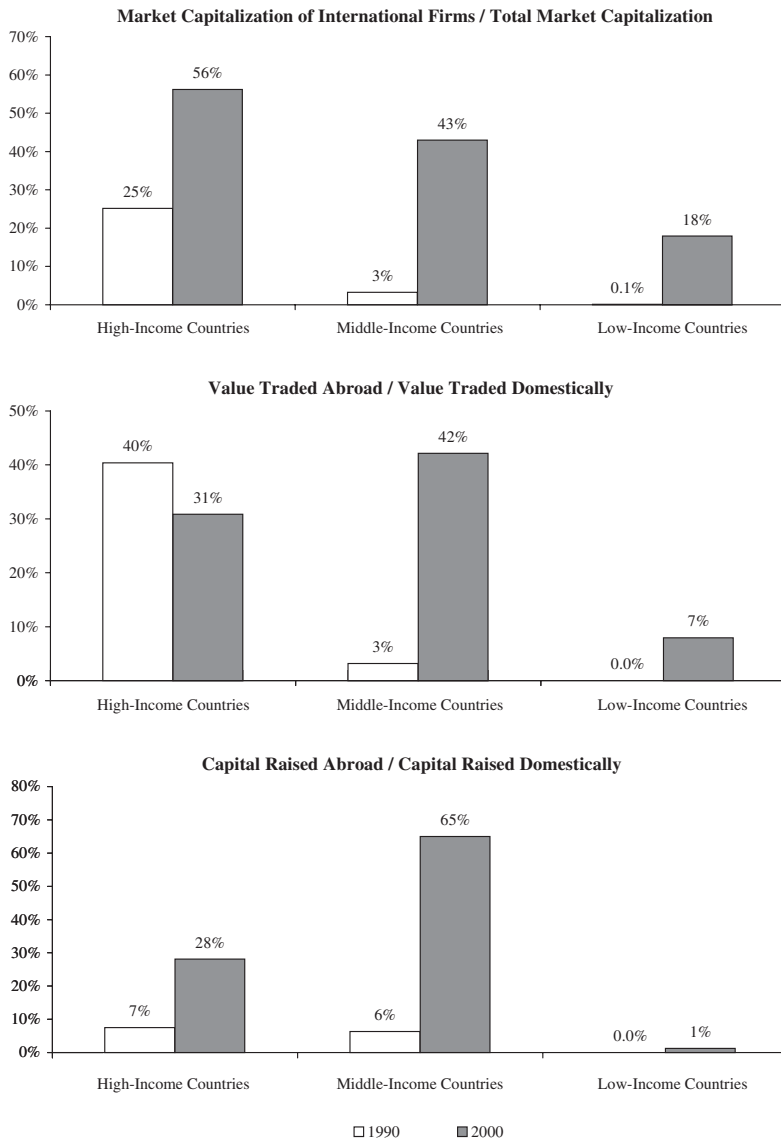


Fig. 3. Internationalization of stock markets relative to domestic activity. This figure shows market capitalization of international firms over total market capitalization, value traded abroad over value traded domestically, and capital raised abroad over capital raised domestically at two points in time. The series are averages across countries, grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). The sources are Standard & Poor's (former IFC) Emerging Markets Database for market capitalization and value traded domestically and World Federation of Exchanges for capital raised domestically. Market capitalization of international firms is computed by aggregating firm level data from Standard & Poor's (former IFC) Emerging Markets Database, Worldscope, and Bloomberg. Value traded abroad is computed by aggregating firm level data from Bank of New York. Capital raised abroad is computed by aggregating firm level data from Bank of New York and Euromoney.

number of listings. For high-income countries, for example, the average number of companies listed on domestic exchanges increased from 703 in 1990 to 900 in 2000.

Value traded as a ratio of GDP has also grown strongly in the high-income group with over a 15-fold increase during the period 1975–2000 and over a six-fold increase between 1990 and 2000. Fig. 1 shows that growth has been less pronounced in the middle- and low-income group. The growth patterns in value traded mimic those in market capitalization. As for capital raised, Fig. 1 shows that low- and middle-income countries have much lower ratios of capital raised to GDP than high-income countries do, although again there are large variations among countries within each group. Capital raising figures show a sharp increase for high-income countries over the period, but for middle- and low-income nations, capital raised domestically over GDP remained flat or decreased between 1990 and 2000.

Fig. 2 displays the three measures of the extent of internationalization: market capitalization of international firms as a ratio of GDP, value traded abroad relative to GDP, and capital raised abroad over GDP. Again, the figures show the indicators split by income group. As a ratio of GDP, the patterns for market capitalization of international firms, value traded abroad, and capital raised abroad for the three groups of countries are similar to those for domestic activity. For high-income countries, the market capitalization of international firms increased from ten percent of GDP to 69% between 1990 and 2000. In middle- and low-income countries, market capitalization of international firms increased from less than one percent of GDP to 15% and four percent, respectively. Similar patterns across income groups can be observed in the panels that display value traded abroad and capital raised abroad to GDP.

Fig. 3 shows the three indicators of the degree of internationalization relative to domestic activity: market capitalization of international firms as a ratio of total market capitalization, value traded abroad relative to value traded domestically, and capital raised abroad over capital raised domestically. The ratio of market capitalization of international firms to total market capitalization shows clearly how strong the internationalization trend has been, especially for middle-income countries. For these economies, the ratio of market capitalization of international firms to total market capitalization jumped from only a few percentage points in 1990 to 43% in 2000. In the low- and high-income countries, the ratio of foreign to total market capitalization also rose sharply. In 2000, market capitalization of international firms over total market capitalization stood at an average 56% for high-income countries and 18% for low-income countries.¹²

Somewhat similar trends are present for value traded abroad relative to value traded domestically and for capital raised abroad over capital raised domestically, a pronounced increase for middle-income countries during the 1990s and a relatively slow increase for low-income countries. The average trading ratio for middle-income countries, for example, rose from a few percentage points to 42% in 2000, and more trading takes place abroad than at home for many of these countries. At the same time, the average ratio of trading abroad to home trading rose from zero to seven percent for low-income countries. The high-income country group saw a decline in

¹² The (increasing) market capitalization of international firms is accounted for by relatively few companies, as typically large companies list abroad. But the growth in the number of international firms has been large as well. Though not reported in the appendix tables, for middle-income countries, the average number of companies listed abroad per country increased from four in 1990 to 24 in 2000. Low-income countries had on average 14 companies listed abroad in 2000. With more companies listing abroad, high-income countries experienced the highest average increase in terms of numbers. While, on average, only 21 companies were trading abroad in 1990, this number increased to 65 in 2000 for high-income countries. See Claessens et al. (2003) for more information on the characteristics of firms going abroad.

the share of trading abroad in the last few years, with the ratio decreasing from 40% to 31% between 1990 and 2000.¹³

In terms of capital raised abroad, the trends towards internationalization are striking as well, especially for the middle-income countries. For this group, capital raised abroad relative to capital raised domestically jumped from six percent in 1990 to 65% in 2000. The increase was less pronounced in high-income countries, going from 7% to 28% during the same period. Low-income countries, on the other hand, had an almost negligible ratio of capital raised abroad relative to capital raised domestically over the whole period.

3. Dependent and explanatory variables, methodology, and results

In this section, we investigate how economic fundamentals explain the stock market development and internationalization processes described above by estimating different regressions. We first discuss the dependent and explanatory variables we use, then describe the methodology, and finally present the regression results.¹⁴

3.1. *Dependent and explanatory variables*

We want to analyze the determinants of domestic stock market development and internationalization. We also want to study whether the internationalization process is more, less, or equally sensitive to economic fundamentals than the domestic stock market development process. To do all this, we use the nine variables described in Section 2 as dependent variables.

Although many other papers have already studied the determinants of domestic stock market development, we still study local market development as a benchmark to the analysis of internationalization. Of the estimations, the regressions analyzing the ratio of international to domestic activity are the main focus of attention in this paper. The ones using the ratios of international activity to GDP are also informative because they portray the extent of the internationalization process, not just relative to domestic activity.

In terms of explanatory variables, we use variables found to be important in the literature on stock market development (see [Levine, 2005](#)). Many papers have shown that stock market development varies with the overall level of development of the country (see, for example, [La Porta et al., 1997, 2006](#); [Levine, 1999](#); [Rajan and Zingales, 2003](#)), with more developed countries having deeper markets. We therefore use a general measure of development, in particular, GDP per capita in U.S. dollars. Furthermore, as the legal and institutional environments have been found to matter for financial development (see [Beck and Levine, 2005](#)), we use measures of countries' legal systems. Specifically, for the quality of the institutional framework, we use the law and order index, as reported by the International Country Risk Guide service. We also use a dummy for English legal origin, which has been shown to be correlated with judicial efficiency and legal rights, including the strength of minority shareholders protection (see [La Porta et al., 1998](#)).

We include two variables to control for macroeconomic performance, the inflation rate over the year and the level of government deficit over GDP, since macroeconomic instability tends to adversely affect financial market development (see, for example, [Bencivenga and Smith, 1992](#);

¹³ This number may underestimate the degree of internationalization, however, because while we have data on trading in ADRs and GDRs, the main vehicle used for internationalization by firms from low- and middle-income countries, we do not cover trading in cross-listed stocks, a vehicle more typically used by firms from high-income countries.

¹⁴ The variables used in this analysis are described in more detail in Appendix Table 2.

Boyd et al., 2001; Huybens and Smith, 1999). Moreover, a large government deficit can crowd out private capital markets, as governments may tap capital markets to finance it.

We also control for the extent of financial openness as that has been found to affect local stock market development (Bekaert and Harvey, 2000, 2003; Edison and Warnock, 2003a; Henry, 2000; Kim and Singal, 2000; Levine and Zervos, 1998). Furthermore, an open capital account is a prerequisite for firms to access international markets (and for international investors to access local markets). To capture financial openness we use three different indicators. As a measure of general financial liberalization, and specifically for the ease of foreign ownership in a country, we use the *de jure* measure of capital account liberalization reported by the IMF.¹⁵ Since we are analyzing stock markets, we also use a specific *de jure* indicator of stock market liberalization, which unfortunately has a narrower country coverage. More precisely, we combine the Bekaert et al. (2005) official liberalization dates, which mostly comprise developing countries, with the Kaminsky and Schmukler (2003) measure of liberalization, which also includes developed economies, to get the widest possible coverage.¹⁶ Alternatively, as a measure of *de facto* openness, we use equity flows, including both portfolio equity flows and foreign direct investment (FDI) flows, relative to GDP.¹⁷ This variable captures the effective integration with international capital markets and the *de facto* openness of the stock market; it can also be viewed as a measure of foreign demand for domestic equity.

Finally, we control for the possibility that local capital market development and the participation in international markets are affected by the growth opportunities that firms face. The initial public offering (IPO) literature (see Ritter and Welch, 2002 for a review) has highlighted the role that growth opportunities play in affecting the desire of firms to seek external financing. Growth opportunities thus may be particularly relevant for explaining capital raising behavior. Moreover, firms may go abroad simply because they face good domestic and/or international growth opportunities, become too large for the domestic equity market, and must raise capital in international markets. Growth opportunities may have an effect that is irrespective of or in addition to that of the economic fundamentals mentioned above. In fact, in a broad sense, growth opportunities could also be interpreted as another economic fundamental. The level of growth opportunities can thus affect both the development of local stock markets (since countries with better growth opportunities may need larger stock markets to satisfy a higher demand for external funds) and the desire of firms to access international equity markets (to the extent that international markets provide an alternative, and often cheaper, source of financing).

While controlling for growth opportunities is important, growth opportunities are difficult to measure, especially at an aggregate country level. Also, one needs an indicator that is exogenous,

¹⁵ This measure has advantages and drawbacks. Perhaps, the main advantage is its wide coverage. One drawback is that 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 was a simple dummy variable. As a consequence, we needed to splice the two series together to create a series of capital account liberalization going back. We did 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.

¹⁶ Alternatively, we ran regressions using just the Bekaert et al. (2005) variable and their “First Sign” stock liberalization measure, which is based on the earliest of three possibilities: the launching of a country fund, an ADR announcement, and the official liberalization date. We obtained similar results using these measures, but to save space we do not report them. Another possible variable is the Edison and Warnock (2003b) index of the intensity of stock market liberalization. However, this measure is limited to 29 emerging markets, so it would restrict our sample too much.

¹⁷ We include FDI flows because those flows, apart from new investment, also represent purchases of existing equity. In fact, equity flows are classified as FDI flows when they represent a purchase of at least ten percent of a company’s equity.

in the sense that it does not use local price information. Fortunately, we are able to use the global growth opportunities index from [Bekaert et al. \(in press\)](#), which measures how each country's industry mix is priced in global capital markets, using the price earnings ratios of global industry portfolios.¹⁸

3.2. Methodology

In all cases, we pool the data over time and across countries to use both balanced and unbalanced panels.¹⁹ For all our tests, we use the same regressors for both domestic stock market development and internationalization. Regarding the estimation techniques, we use least squares estimators with random effects for the variables related to domestic market development. For the variables capturing the internationalization of stock markets, we estimate random effects Tobit models. The difference in techniques is motivated by the different nature of the data on domestic and international activity. There are data on capitalization, value traded, and capital raised for the domestic market of most countries analyzed; otherwise there are missing observations. In this case, linear estimations can yield consistent and efficient results. For the variables related to the internationalization of stock markets, we have either positive values or observations with zeros. These zeros are informative because they mean that the data are censored at that point. Tobit models account for this feature of the data and yield consistent estimates. Random effects models, used for both regressions, take into consideration the possible lack of homoscedasticity in the data, estimating different variances across countries.

Before reporting the results, there are two further methodological points worth discussing. First, in general, while we believe that the variables used are largely exogenous to the different measures of stock market development and internationalization, there can still be endogeneity left. One variable that might be more susceptible to endogeneity is capital flows, given that foreign investment tends to go to countries with more developed markets and more open to internationalization. To reduce this potential problem, and since good instruments are hard to obtain, we use the capital flow variable lagged one period. To confirm that our results are not affected by this variable, we also report estimations without it. We find that the coefficients on the other variables are unaffected by the inclusion of this variable, and therefore do not think that this type of endogeneity is driving the results. In any event, our main interest lies in the comparison between how fundamentals affect domestic stock market development and internationalization, and we do not think that the potential endogeneity of some variables affects this comparison. Moreover, we try to avoid giving the impression that we estimate a causal relation.

The second methodological point is that we enter the inflation rate linearly in the specifications. However, the theoretical literature on credit market frictions, finance, and growth suggests that the relation between inflation and financial sector development may be characterized by thresholds. [Boyd et al. \(2001\)](#) confirm econometrically that higher levels of inflation are associated with smaller, less active, and less efficient banking systems and stock markets. They also highlight the nonlinear relation between inflation and financial sector

¹⁸ [Bekaert et al. \(in press\)](#) use two country-specific industry weightings to calculate each country's growth opportunities index. One is based on the relative market capitalization of each industry in the local stock market. The other one is based on the relative value added of each of the industries in the respective country. We report the results using the latter weighting scheme, but also estimated the regressions using the former, obtaining similar results.

¹⁹ For the regressions of internationalization, we exclude the U.S. and U.K., since these are the main financial centers where the internationalization takes place. Both countries are included in the regressions of domestic stock market development. We also estimated these regressions excluding these countries, and obtained analogous results.

Table 1
Stock market development

	Market capitalization/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.213*** [7.462]	0.144*** [5.091]	0.200*** [7.667]	0.163*** [6.969]	0.121*** [4.548]	0.130*** [4.895]
Law and order	0.014 [0.962]	0.026* [1.707]	0.006 [0.448]	0.012 [1.063]	0.004 [0.298]	0.003 [0.250]
English legal origin						0.224** [2.286]
Log (1 + inflation)	−0.017 [0.471]					
Government deficit/GDP		−2.625*** [7.385]	−2.044*** [6.670]	−1.770*** [6.471]	−2.110*** [7.220]	−2.079*** [7.123]
Capital account liberalization	0.098*** [2.682]	0.051 [1.270]				
Stock market liberalization			0.059** [1.993]			
Total equity flows/GDP (one year lagged)				3.845*** [7.583]	4.747*** [8.041]	4.607*** [7.782]
Global measure of country growth opportunities					0.439*** [8.059]	0.435*** [7.997]
No. of observations	1007	843	745	802	684	684
No. of countries	77	73	55	71	49	49
Overall R-squared	0.205	0.229	0.205	0.270	0.352	0.416

	Value traded domestically/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.215*** [9.347]	0.115*** [6.716]	0.126*** [6.410]	0.101*** [5.919]	0.086*** [4.161]	0.089*** [4.231]
Law and order	−0.018 [1.609]	0.000 [0.006]	−0.005 [0.383]	−0.005 [0.498]	−0.013 [1.128]	−0.013 [1.146]
English legal origin						0.051 [0.800]
Log (1 + inflation)	0.016 [0.563]					
Government deficit/GDP		−1.425*** [6.102]	−1.558*** [5.830]	−1.243*** [5.080]	−1.471*** [5.480]	−1.460*** [5.430]
Capital account liberalization	0.049 [1.788]	0.004 [0.171]				
Stock market liberalization			0.006 [0.223]			
Total equity flows/GDP (one year lagged)				2.851*** [6.518]	3.582*** [6.729]	3.527*** [6.563]
Global measure of country growth opportunities					0.300*** [5.937]	0.299*** [5.903]
No. of observations	999	838	741	797	681	681
No. of countries	77	73	55	71	49	49
Overall R-squared	0.150	0.175	0.197	0.233	0.281	0.292

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Table 1 (*continued*)

	Capital raised domestically/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.011*** [3.727]	0.006*** [3.140]	0.002 [1.151]	0.002 [1.301]	0.000 [0.172]	0.000 [0.236]
Law and order	−0.007*** [3.518]	−0.002** [2.012]	−0.002** [2.185]	−0.002* [1.773]	−0.002* [1.898]	−0.002* [1.881]
English legal origin						0.007* [1.903]
Log (1 + inflation)	−0.002 [0.595]					
Government deficit/GDP		−0.021 [0.993]	−0.016 [0.729]	−0.011 [0.520]	−0.023 [1.063]	−0.021 [0.987]
Capital account liberalization	0.007* [1.850]	−0.001 [0.462]				
Stock market liberalization			0.009*** [3.165]			
Total equity flows/GDP (one year lagged)				0.194*** [5.087]	0.181*** [4.734]	0.168*** [4.381]
Global measure of country growth opportunities					0.013*** [3.369]	0.013*** [3.403]
No. of observations	541	468	438	437	414	414
No. of countries	43	41	37	39	34	34
Overall <i>R</i> -squared	0.034	0.000	0.006	0.051	0.098	0.157

This table shows least square regressions estimated using random effects models for a panel of 78 countries between 1984 and 2000. A constant is estimated but not reported. Absolute values of *z*-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. See Appendix Table 2 for the definition of the variables.

performance. Therefore, as an alternative, we also explored nonlinear effects of inflation on domestic stock market development. Though not reported in the tables to save space, the results suggest that nonlinear effects might be important, although they do not affect the basic conclusions reported here.

3.3. Regression results

Regression results for the domestic development variables, the foreign activity variables, and the ratios of international to domestic activity are presented in Tables 1, 2 and 3, respectively. The tables provide in the first column the results for the basic regression with GDP per capita, law and order, inflation, and capital account liberalization as the only four explanatory variables. The tables then report a regression with government deficit over GDP instead of inflation, since these two constitute alternative indicators of macroeconomic soundness and stability. To keep the size of the tables manageable, we just continue to use one of the macro variables, government deficit to GDP. We choose this variable since inflation, without taking into account the nonlinear effects, is statistically insignificant in many regressions explaining the domestic variables. In the third and fourth columns, the tables report regressions with the stock market liberalization index and actual (lagged) equity flows as a share of GDP respectively replacing the capital account liberalization dummy. In the fifth and sixth columns, the growth opportunities index is introduced, with the lagged equity flows remaining. In the sixth column,

Table 2

Stock market internationalization relative to GDP

	Market capitalization of international firms/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.123*** [6.246]	0.084*** [4.230]	0.095*** [6.064]	0.083*** [4.799]	0.073*** [4.626]	0.074*** [4.859]
Law and order	0.029* [1.663]	0.043*** [3.215]	0.027* [1.953]	0.042*** [3.487]	0.046*** [3.616]	0.047*** [3.611]
English legal origin						−0.024 [0.574]
Log (1 + inflation)	−0.126** [2.355]					
Government deficit/GDP		−0.932*** [3.726]	−0.849*** [3.296]	−0.687*** [2.588]	−0.647** [2.134]	−0.947*** [2.781]
Capital account liberalization	0.067** [2.084]	0.043 [1.489]				
Stock market liberalization			0.228*** [4.624]			
Total equity flows/GDP (one year lagged)				3.531*** [8.661]	3.642*** [8.121]	4.201*** [7.609]
Global measure of country growth opportunities					0.280*** [5.079]	0.295*** [5.302]
No. of observations	706	557	477	536	434	434
No. of countries	71	66	51	64	46	46
No. of uncensored observations	541	441	378	423	359	359
No. of left-censored observations	165	116	99	113	75	75

	Value traded abroad/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.062*** [5.802]	0.032*** [8.642]	0.031*** [9.965]	0.031*** [11.893]	0.035*** [9.487]	0.027*** [8.637]
Law and order	0.001 [0.141]	0.004 [1.475]	0.000 [0.023]	0.002 [0.892]	0.004 [1.406]	0.004* [1.832]
English legal origin						−0.008 [1.370]
Log (1 + inflation)	−0.048*** [3.113]					
Government deficit/GDP		−0.185*** [4.210]	0.012 [0.211]	−0.108** [2.169]	−0.002 [0.027]	−0.094* [1.874]
Capital account liberalization	0.017 [1.330]	0.008 [1.460]				
Stock market liberalization			0.054*** [5.582]			
Total equity flows/GDP (one year lagged)				0.630*** [7.443]	0.672*** [7.715]	0.736*** [9.097]
Global measure of country growth opportunities					0.031*** [2.859]	0.033*** [3.111]
No. of observations	772	611	493	578	445	445
No. of countries	75	70	50	67	44	44
No. of uncensored observations	357	287	260	276	253	253
No. of left-censored observations	415	324	233	302	192	192

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Table 2 (continued)

	Capital raised abroad/GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.003*** [6.874]	0.003*** [6.164]	0.002*** [4.686]	0.003*** [5.332]	0.002*** [4.021]	0.002*** [3.945]
Law and order	0.001*** [2.878]	0.001*** [4.040]	0.000 [0.328]	0.001*** [3.035]	0.001** [2.334]	0.001** [2.329]
English legal origin						0.000 [0.180]
Log (1 + inflation)	−0.002 [1.270]					
Government deficit/GDP		−0.017** [2.208]	−0.011 [1.459]	−0.017** [2.129]	−0.014* [1.867]	−0.014* [1.855]
Capital account liberalization	0.001 [1.139]	0.002** [2.104]				
Stock market liberalization			0.008*** [7.258]			
Total equity flows/GDP (one year lagged)				0.055*** [4.572]	0.044*** [3.265]	0.044*** [3.167]
Global measure of country growth opportunities					0.009*** [5.836]	0.009*** [5.822]
No. of observations	1,056	884	760	825	669	669
No. of countries	76	72	53	70	47	47
No. of uncensored observations	444	372	326	352	311	311
No. of left-censored observations	612	512	434	473	358	358

This table shows Tobit regressions estimated using random effects models for a panel of 78 countries between 1984 and 2000. A constant is estimated but not reported. Absolute values of *z*-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. See Appendix Table 2 for the definition of the variables.

we include the English legal origin dummy as a proxy for shareholders rights and the general quality of the legal system. We discuss the results in turn.

The regression results for the ratio of market capitalization to GDP (Table 1, top panel) indicate that general stock market development in our sample of countries and time period is related to the variables in ways already identified in the literature. In particular, GDP per capita, enforcement of laws, and English legal origin are positively associated with stock market capitalization, while inflation and government deficits are negatively related to stock market development. However, not all variables are always statistically significant, in part because the correlations are quite high, such as between GDP per capita and the law and order index.²⁰ More financial openness, measured by any of the three indicators (capital account liberalization, stock market liberalization, and actual equity flows), is also positively related to stock market development (although capital account liberalization is not statistically significant when the regression also includes the government deficit). The growth opportunities variable enters positively and significantly in the last two specifications. This positive relation may

²⁰ The correlation between GDP per capita and the law and order index for our sample is 0.75 and is significant at the one percent level. We also estimated these regressions without including GDP per capita and found law and order to be significant, while the results for the rest of the variables remain mostly the same.

Table 3

Stock market internationalization relative to domestic activity

	Market capitalization of international firms/total market capitalization					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.084*** [6.548]	0.146*** [13.507]	0.181*** [13.257]	0.136*** [14.300]	0.127*** [13.310]	0.130*** [10.728]
Law and order	0.032*** [2.981]	0.040*** [4.519]	0.032*** [3.237]	0.051*** [5.606]	0.054*** [5.645]	0.042*** [4.285]
English legal origin						0.046** [2.006]
Log (1 + inflation)	−0.214*** [7.686]					
Government deficit/GDP		−0.670*** [3.719]	0.259 [1.410]	−0.223 [0.789]	−0.253 [1.200]	0.281 [1.371]
Capital account liberalization	0.075*** [3.177]	0.058*** [3.032]				
Stock market liberalization			0.211*** [5.930]			
Total equity flows/GDP (one year lagged)				3.217*** [9.976]	2.868*** [8.697]	2.609*** [7.684]
Global measure of country growth opportunities					0.194*** [4.488]	0.190*** [4.509]
No. of observations	682	525	461	516	419	419
No. of countries	71	65	51	64	45	45
No. of uncensored observations	535	426	372	417	44	344
No. of left-censored observations	147	99	89	99	75	75

	Value traded abroad/value traded domestically					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.308*** [5.420]	0.458*** [8.370]	0.398*** [9.438]	0.345*** [11.280]	0.370*** [9.191]	0.272*** [5.909]
Law and order	0.052 [1.455]	0.113*** [2.644]	−0.027 [0.879]	0.102*** [4.088]	0.011 [0.428]	0.050 [1.267]
English legal origin						−0.187 [1.460]
Log (1 + inflation)	−0.447*** [4.764]					
Government deficit/GDP		−0.045 [0.049]	2.046*** [3.649]	1.746** [2.336]	1.991*** [3.416]	1.781** [2.201]
Capital account liberalization	0.155 [1.625]	0.130 [1.217]				
Stock market liberalization			0.607*** [5.425]			
Total equity flows/GDP (one year lagged)				5.421*** [6.099]	6.048*** [6.435]	5.390*** [4.930]
Global measure of country growth opportunities					0.149 [1.179]	0.177 [1.276]
No. of observations	720	571	470	546	438	438
No. of countries	73	67	49	65	44	44
No. of uncensored observations	345	282	255	271	248	248
No. of left-censored observations	375	289	215	275	190	190

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Table 3 (continued)

	Capital raised abroad/capital raised domestically					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.287*** [3.656]	0.308*** [3.572]	0.298*** [3.356]	0.310*** [3.927]	0.272*** [3.272]	0.269*** [3.207]
Law and order	−0.087 [1.540]	−0.082 [1.221]	−0.155** [2.039]	−0.084 [1.369]	−0.051 [0.781]	−0.051 [0.771]
English legal origin						−0.071 [0.545]
Log (1 + inflation)	−0.185 [1.280]					
Government deficit/GDP		−2.903** [2.228]	−2.353* [1.687]	−0.976 [0.678]	−1.150 [0.803]	−1.206 [0.838]
Capital account liberalization	0.119 [1.025]	0.106 [0.797]				
Stock market liberalization			0.789*** [3.430]			
Total equity flows/GDP (one year lagged)				7.558*** [3.354]	5.769** [2.528]	6.059*** [2.581]
Global measure of country growth opportunities					0.884*** [2.947]	0.883*** [2.942]
No. of observations	506	434	404	403	380	380
No. of countries	41	39	35	37	32	32
No. of uncensored observations	339	278	264	261	252	252
No. of left-censored observations	167	156	140	142	128	128

This table shows Tobit regressions estimated using random effects models for a panel of 78 countries between 1984 and 2000. A constant is estimated but not reported. Absolute values of *z*-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. See Appendix Table 2 for the definition of the variables.

arise because firms with more growth opportunities seek more external financing, spurring domestic market development. Note that the equity flows variable remains significant in the regressions that include growth opportunities, so the significance of this variable is not due to capital flows being correlated with growth opportunities. The English legal origin dummy enters positively and significantly in the regression in column six, consistent with the idea that common law systems have better protection of shareholder rights.

The regression results for the ratio of domestic value traded to GDP (Table 1, middle panel) indicate that value traded is related to the same variables that drive market capitalization. More developed countries have more trading activity; law and order though is not statistically significantly correlated with trading. Countries with higher government deficits have lower domestic trading activity. The *de jure* liberalization indicators are not always statistically significant, but equity flows are positively and significantly related to the level of trading. Countries with better growth opportunities have a higher domestic trading. Though not reported, the results are similar when using the ratio of trading domestically to market capitalization.

When considering the ratio of capital raised domestically to GDP (Table 1, bottom panel), we find similar results as for the other two variables, although fewer variables are statistically significant, in part due to the lumpy and volatile nature of capital raising activity. More developed countries tend to see more capital raising, though GDP per capita is not always significant. Perhaps

surprisingly, the law and order variable is statistically significant and negative in several specifications, although this seems to be driven by a few countries, such as South Africa, Philippines, Indonesia, Thailand, and Malaysia, that have very high values of capital raised domestically over GDP and relatively low values of law and order. Furthermore, the government deficit over GDP is not statistically significant. Capital account and stock market liberalization as well as equity flows, when statistically significant, are positively related to capital raised over GDP. The growth opportunities index is statistically significant and positive, whereas the English legal origin variable, a proxy for shareholders right, is positive and significant (although only at the ten percent level) in the last regression.

The Tobit regression results for the ratio of market capitalization of international firms to GDP are shown in the top panel of Table 2. The results indicate that the degree of internationalization is related to some of the same factors that are correlated with domestic stock market development. In particular, GDP per capita and law and order are positively associated with the market capitalization of international firms. On the other hand, more inflation and larger government deficits are correlated with lower relative market capitalization of international firms, again consistently so. The different measures of financial openness—the capital account and stock market liberalization indexes as well as the ratio of equity capital flows to GDP—are in a consistently positive manner related to the ratio of market capitalization of international firms to GDP. The growth opportunities index is strongly related to the market capitalization of international firms, but the legal origin dummy is not statistically significant.

The value of trading abroad relative to GDP also increases with the level of economic development (Table 2, middle panel). Law and order are, however, not statistically significant. Higher inflation and government deficits are negatively related to the value of shares traded abroad, being statistically significant in some specifications. Financial openness, measured by capital account and stock market liberalization and equity flows, is positively related to value traded abroad, but the capital account liberalization index is not statistically significant. Growth opportunities are also positively related to trading abroad, but the legal origin dummy is again not statistically significant.

The amount of capital raised abroad to GDP is also a function of similar factors (Table 2, bottom panel). The more developed the economy and the higher the law and order index, the greater the amount of capital raised abroad relative to GDP. Furthermore, the degree of financial openness is positively associated with capital raised abroad. Growth opportunities seem to induce firms to raise capital in international equity markets.

In sum, the results suggest that, in general, internationalization is related to the same economic fundamentals that correlate with the development of domestic stock markets, and in the same direction. Higher income, greater macroeconomic stability (associated with lower inflation and reduced fiscal deficits), stronger legal systems, more financial openness, and better growth opportunities are all positively related with both domestic stock market development and internationalization relative to GDP. In other words, better economic fundamentals seem to help develop local markets, but also increase internationalization.

These findings are at odds with the hypothesis that countries with worse fundamentals are the ones that see firms seeking stock exchange activities in international markets. Rather, these findings support the view that better fundamentals facilitate both domestic stock market development as well as access to foreign markets, with firms being able to attract foreign capital as their countries become more attractive. The role of foreign investment as a demand factor is highlighted by the fact that, after controlling for the level of development, institutions, macroeconomic indicators, and growth opportunities, equity flows are consistently positively and significantly correlated with all the indicators of stock market internationalization.

Though the results above show that the factors that are related to domestic stock market development are also related in the same direction to internationalization, the estimated coefficients do not reveal whether domestic stock market development and internationalization are similarly sensitive to fundamentals. The difficulty in comparing the coefficients comes in part from the fact that we use different samples and different models to estimate the two processes (a linear estimation and a Tobit one, respectively). To measure how economic fundamentals are related to internationalization relative to how they are related to domestic stock market development, we next study the ratio of foreign activity to domestic activity, e.g., the ratio of market capitalization of international firms to total market capitalization. If the two variables, foreign and domestic activity, are related in a similar way and to the same degree to the independent variables we use, then these variables should not affect the degree of internationalization and the coefficients will be insignificant.

The regression results for the ratio of market capitalization of international firms to total domestic market capitalization (Table 3, top panel) indicate that the degree of internationalization is also related to fundamentals, and in a similar way. In particular, GDP per capita and enforcement of laws are positively and statistically significantly associated with the ratio of the market capitalization of international firms to total market capitalization. English legal origin is statistically significant and positive, suggesting that countries with better legal systems are more attractive to investors in international financial centers and thus see relatively more internationalization of their stock market activity. Inflation and fiscal deficit (the latter only in one specification) have a negative and statistically significant effect on this ratio. Capital account openness, stock market liberalization, and lagged equity flows are associated with greater internationalization. This positive sign is perhaps surprising: most countries opened their financial systems with the intention of attracting foreign investment and developing their own local financial markets, not to see their firms migrate to international financial markets. Growth opportunities positively affect the ratio, suggesting that firms with greater growth opportunities tend to go abroad.

These findings imply that, while stock market development and the degree of internationalization are related to the same fundamentals, improvements in these fundamentals seem to accelerate internationalization more. Specifically, increases in GDP per capita, reductions in inflation, improvements in legal institutions, and more openness—in terms of rules and actual integration—appear to affect international activity more, leading to an increase in the share of market capitalization listed abroad. Particularly interesting is the statistically significant positive coefficient of the growth opportunities variable, which suggests that firms from countries with better growth opportunities seek out international markets relatively more than domestic ones, perhaps due to the inability of domestic markets to finance those opportunities at a relatively low cost.

The ratio of value traded abroad to value traded domestically shows a similar pattern, increasing with the level of economic development, law and order, and financial openness (Table 3, middle panel). Inflation is also negatively related to the relative value traded abroad. The English legal origin dummy is not statistically significant, but stock market liberalization and the ratio of equity flows to GDP are both statistically significant and positive, suggesting that *de jure* and *de facto* liberalization facilitates trading abroad relatively more. The growth opportunities variable is positive, but not statistically significant. Surprisingly, the government deficit, when significant, is positively related to the value traded abroad. This does not mean that a larger government deficit boosts the trading of local shares in international markets. To the contrary, the results in Table 2 show that a larger government deficit seems to be associated with lower trading abroad. The results in Table 3 rather suggest that government deficits have a greater negative impact on domestic value traded, i.e., a greater government deficit crowds out domestic market trading more than international trading.

Finally, we find that the more developed the economy, the greater the ratio of capital raised abroad to capital raised domestically (Table 3, bottom panel). Government deficit is only statistically significant with a negative coefficient in two specifications. Stock market liberalization and equity flows are significant and positive in all specifications, suggesting that a more open environment makes it relatively easier to raise capital abroad. Growth opportunities also positively affect the degree of capital raising abroad. The regression results on capital raised, however, are not as consistent as the other regressions. Again, the lack of significance of many of the variables may be explained by the fact that the ratio of capital raised abroad to capital raised domestically is very volatile from year to year, partly due to the lumpy nature of capital raising, with individual issues greatly impacting the ratio. But, it could also reflect that capital raising domestically and abroad are not distinctly affected by the economic fundamentals considered.

4. Robustness tests and extensions

The results reported in Section 3 suggest that the variables that affect the development of domestic capital markets also tend to influence the internationalization process, and in the same direction. Moreover, their effects on internationalization seem to be stronger. While the results tend to be consistent across specifications, there is variation across regressions due to a number of factors. To start, there is multicollinearity among some of the explanatory variables. Also, the data coverage changes across specifications. Furthermore, different variables may capture different aspects of the relations. In this section, we report additional estimations that shed more light on the results.

We conduct four additional tests to check the robustness of the previous estimates and complement them. First, we investigate whether the unbalanced nature of the data makes for any differences. Second, we directly test the hypothesis that the degree of internationalization is driven by past local market development. Third, we use additional explanatory variables. Fourth, we analyze whether the estimation technique affects the results.

In the previous section, we use unbalanced panels in the regressions, as data for some countries are not available for the whole period. This means that we are comparing somewhat different groups of countries over time, which could affect our results. We now report regressions using a balanced panel for each specification, such that for each regression we have the same group of countries with observations for all years, but the country coverage is still different across specifications.²¹ Since our main focus is the relative degree of internationalization, we report only the results for the ratio of international market activity to local market activity using a balanced panel. The results are shown in Table 4.²²

The regression results are generally robust to the use of balanced panels. Variables like GDP per capita, law and order, English legal origin, the various liberalization indicators, and growth opportunities remain statistically significant and positive in explaining the ratio of market capitalization of international firms to total market capitalization. Inflation remains statistically significant and negative, although government deficit is statistically significant only in two

²¹ We allow the country coverage to vary across specifications to maximize the number of observations. Also note that to increase the number of countries with observations for every year, we combined the data on fiscal deficit from the World Bank World Development Indicators (WDI), which we use in the regressions presented in Tables 1–3, with data from the IMF International Financial Statistics (IFS) and World Economic Outlook (WEO). The reason is that the WDI database has missing data for fiscal deficit for many countries after 1998. Still, even when combining these sources, the sample in the regressions is reduced to a maximum of only 29 countries.

²² We also estimated the regressions for domestic and international activity relative to GDP using a balanced panel and found the results to be robust to this change.

Table 4

Stock market internationalization relative to domestic activity — balanced panel

	Market capitalization of international firms/total market capitalization					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.132*** [11.028]	0.240*** [17.588]	0.175*** [10.851]	0.155*** [12.496]	0.182*** [13.016]	0.187*** [12.480]
Law and order	0.029** [2.560]	0.054*** [4.979]	0.055*** [3.807]	0.072*** [6.229]	0.053*** [4.570]	0.050*** [4.332]
English legal origin						0.123*** [5.094]
Log (1 + inflation)	−0.154*** [6.750]					
Government deficit/GDP		−0.829*** [4.189]	−0.438* [1.953]	−0.123 [0.509]	−0.224 [0.773]	0.258 [1.196]
Capital account liberalization	0.052** [2.433]	0.097*** [4.518]				
Stock market liberalization			0.183*** [3.555]			
Total equity flows/GDP (one year lagged)				2.687*** [8.901]	2.400*** [8.423]	2.015*** [6.997]
Global measure of country growth opportunities					0.240*** [5.293]	0.231*** [5.235]
No. of observations	408	336	336	312	312	312
No. of countries	34	28	28	26	26	26
No. of uncensored observations	320	286	286	270	267	267
No. of left-censored observations	88	50	50	42	45	45

	Value traded abroad/value traded domestically					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.331*** [5.346]	0.287*** [3.626]	0.354*** [7.123]	0.383*** [7.045]	0.302*** [6.090]	0.420*** [7.695]
Law and order	0.130*** [2.732]	0.161*** [2.939]	0.056 [1.596]	0.148*** [4.085]	0.160*** [5.068]	0.128*** [3.917]
English legal origin						−0.738*** [8.855]
Log (1 + inflation)	−0.359*** [3.440]					
Government deficit/GDP		−0.888 [0.910]	1.507** [2.534]	1.563* [1.772]	1.727** [2.431]	1.762** [2.413]
Capital account liberalization	0.161* [1.755]	0.226** [2.314]				
Stock market liberalization			0.387*** [3.313]			
Total equity flows/GDP (one year lagged)				3.004*** [2.991]	4.601*** [5.321]	3.579*** [3.917]
Global measure of country growth opportunities					0.036 [0.264]	0.076 [0.561]
No. of observations	516	420	408	348	348	348
No. of countries	43	35	34	29	29	29
No. of uncensored observations	279	275	263	232	225	225
No. of left-censored observations	237	145	145	116	123	123

Table 4 (continued)

	Capital raised abroad/capital raised domestically					
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	0.532*** [3.256]	0.309* [1.727]	0.247 [1.609]	0.191 [1.094]	0.105 [0.598]	0.144 [0.811]
Law and order	−0.082 [0.885]	−0.062 [0.703]	−0.194* [1.910]	−0.054 [0.574]	−0.031 [0.334]	−0.042 [0.453]
English legal origin						0.215 [1.381]
Log (1 + inflation)	−0.084 [0.345]					
Government deficit/GDP		0.334 [0.176]	1.169 [0.621]	3.412 [1.550]	3.005 [1.378]	2.393 [1.079]
Capital account liberalization	−0.012 [0.067]	0.064 [0.366]				
Stock market liberalization			0.864*** [2.723]			
Total equity flows/GDP (one year lagged)				6.647** [2.536]	5.149* [1.937]	4.781* [1.794]
Global measure of country growth opportunities					0.938** [2.405]	0.964** [2.474]
No. of observations	272	255	255	221	221	221
No. of countries	16	15	15	13	13	13
No. of uncensored observations	178	177	180	160	160	160
No. of left-censored observations	94	78	75	61	61	61

This table shows Tobit regressions estimated using random effects models for a panel of 78 countries between 1984 and 2000. For each specification, the sample only includes those countries that have observations for every year for which data on the dependent variable are available. A constant is estimated but not reported. Absolute values of *z*-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. See Appendix Table 2 for the definition of the variables.

specifications. The previous results are maintained for the relative amount of trading abroad and the share of capital raised abroad, although not all variables are always statistically significant—especially for capital raised abroad over capital raised domestically, where the sample of countries drops to 13 in some regressions. However, the general findings hold: more developed countries with better legal systems, more open financial markets, and less macroeconomic instability see more internationalization. Growth opportunities are again positive and significant for the capital raised variable. These regressions thus confirm that our main results are not affected by the unbalanced nature of the regressions.

A second and useful way to test whether firms internationalize to escape poor domestic environments is to investigate the relation between internationalization and (past) stock market development directly.²³ If local market development is positively associated with the share of activity in international markets in subsequent years, then there is further support to the hypothesis that countries with good domestic environments also experience more internationalization. A negative coefficient would support, on the contrary, the idea that firms internationalize to leave less developed local markets. However, testing this relation is not straightforward, because the true underlying link between domestic stock market development and the degree of internationalization

²³ We would like to thank Geert Bekaert for this suggestion.

is not obvious, as countries with more developed markets may see more migration abroad, but stock market development may then be hampered by this internationalization. It is thus difficult to check whether one has the right model. We believe that this is an important question for future research that deserves more attention and exceeds the objectives of this paper. Therefore, the results here should be taken only as a first step to study this relation.

To carry out this new test, we run our regressions for two of our internationalization variables—market capitalization of international firms and value traded abroad as ratios of their respective domestic values—controlling for a lagged indicator of domestic market development. Since we use the lagged domestic market development variable as a regressor, we do not include the factors we used in the other regressions to explain stock market development itself (or internationalization), i.e., we do not include GDP per capita, law and order, and the macroeconomic variables. The only variables we continue to include are the liberalization measures, since even when (lagged) domestic market development may drive internationalization, liberalization is a necessary condition to observe internationalization. As measures of domestic market development, we use either lagged market capitalization or lagged value traded, both as a ratio of GDP.²⁴ For these tests we omit the capital raising variable given its lumpy nature. The results are reported in Table 5.

In the regressions of the degree of internationalization of market capitalization (upper panel) we find that both lagged domestic stock market development variables are consistently positive and significant. In other words, domestic market development is positively associated with subsequent internationalization, what is consistent with the fact that the same fundamentals that drive domestic stock market development also affect internationalization. The three liberalization variables—capital account liberalization, stock market liberalization, and equity flows—have positive signs and are all statistically significant. When using the ratio of value traded abroad to value traded domestically (lower panel), the results are maintained, except that the lagged value trade domestically is not always statistically significant. The liberalization variables remain statistically significant and positive. The regression results thus confirm that domestic market development tends to be positively associated with a higher degree of internationalization. Importantly, we never find that domestic market development is negatively related to internationalization.

In addition to the control variables used throughout the paper, we also tried alternative variables that proxy for other macroeconomic and institutional aspects related to stock market development and internationalization. The other variables we used include interest rates differentials, degree of corruption, and trading costs. Most of these variables are close proxies to the variables for which we report regression results and we obtained similar conclusions. The trading costs variable was only available for a smaller set of countries and thus reduced the sample size too much; also, the variable did not turn out to be significant.²⁵ To save space, we do not report these alternative specifications, but they confirmed the main results reported above.

Finally, we estimated the regressions of domestic market development using fixed effects, instead of random effects, and obtained similar results.²⁶ We also estimated the regressions of

²⁴ The measure of domestic market capitalization we use includes all (domestic and international) firms listed in the local market. We include the capitalization of the firms that go abroad as part of the domestic capitalization because those firms also list, trade, and raise capital in domestic capital markets. Another alternative would be to use a measure of domestic stock market development that includes only those firms that do not internationalize.

²⁵ We considered this variable because, in a cross-country study, Domowitz et al. (2001) show 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.

²⁶ We did not estimate Tobit regressions for the internationalization variables using fixed effects because of the difficulty in computing unbiased estimators.

Table 5
Stock market internationalization and domestic stock market development

	Market capitalization of international firms/total market capitalization							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Market capitalization/GDP (one year lagged)	0.224*** [12.376]	0.222*** [13.812]	0.168*** [9.756]	0.220*** [11.917]				
Value traded domestically/GDP (one year lagged)					0.215*** [8.523]	0.189*** [7.654]	0.184*** [9.179]	0.222*** [7.989]
Capital account liberalization		0.147*** [7.865]				0.142*** [8.236]		
Stock market liberalization			0.318*** [9.432]				0.333*** [9.746]	
Total equity flows/GDP (one year lagged)				0.476*** [2.831]				0.728*** [4.266]
No. of observations	686	678	593	648	689	684	601	630
No. of countries	71	71	56	69	72	72	57	68
No. of uncensored observations	539	531	462	503	546	541	471	487
No. of left-censored observations	147	147	131	145	143	143	130	143

	Value traded abroad/value traded domestically							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Market capitalization/GDP (one year lagged)	0.476*** [7.944]	0.412*** [9.162]	0.284*** [6.758]	0.163*** [3.046]				
Value traded domestically/GDP (one year lagged)					0.176** [2.441]	0.081 [0.799]	0.084 [1.042]	0.092 [1.155]
Capital account liberalization		0.248*** [3.820]				0.208*** [2.661]		
Stock market liberalization			0.536*** [5.561]				0.603*** [6.103]	
Total equity flows/GDP (one year lagged)				1.475*** [3.861]				1.773*** [5.173]
No. of observations	737	729	616	692	722	713	612	689
No. of countries	76	76	54	73	75	75	54	73
No. of uncensored observations	335	346	304	315	342	332	303	315
No. of left-censored observations	402	383	312	377	380	381	309	374

This table shows Tobit regressions estimated using random effects models for a panel of 78 countries between 1984 and 2000. A constant is estimated but not reported. Absolute values of z-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. See Appendix Table 2 for the definition of the variables.

internationalization, both relative to GDP and domestic market development, using least squares estimators with random and fixed effects alternatively (instead of using Tobit estimations). In most cases, the signs and significance of the coefficients tend to be consistent across model specifications, and in economic terms similar conclusions can be obtained from using those estimators.

5. Conclusions

In this paper, we show that the underlying factors affecting the development of local stock markets also drive the internationalization of stock market activities. In particular, we find that, while better fundamentals are associated with an increase in both domestic activity and internationalization, improvements in country fundamentals tend to have a larger impact on capital raising, listing, and trading in foreign exchanges, resulting in a higher international activity relative to the domestic one. We also find that greater domestic market development is followed by a larger share of activity abroad.

The findings that the processes of local stock market development and internationalization are driven by the same factors and that domestic market development is associated with subsequent internationalization are not consistent with the view that countries with bad fundamentals should see relatively more internationalization (and less local market development). They rather support the view that access to international markets depends in part on investors' assessment of the home country environment, and that better fundamentals make firms more attractive to investors in international markets. As such, they imply for one that other factors, aside from those mentioned in the bonding and related literature, are important in driving the process of internationalization. Moreover, our results suggest that, while countries may worry about internationalization, this process may be a natural part of their overall economic and institutional development, including opening to international markets. This raises questions with important policy implications.

One key policy concern of the internationalization process is that it may affect domestic stock market development adversely as too little activity remains at home, exhibiting a potential vicious cycle. With liquidity agglomerating in one market, a process of improved fundamentals and increased internationalization may have negative spillover effects on domestic markets, providing international markets an even greater advantage.²⁷ Large-scale internationalization may thus make it more difficult to sustain fully fledged local stock exchanges. This may not be a concern for the larger corporations that are likely to be driving the process of internationalization in any case. But many medium-sized firms may not be able to go directly overseas and may find it difficult to obtain equity financing when domestic markets shrink. This phenomenon would have major implications for such firms.

To conclude, several extensions could complement the analysis conducted in this paper. Although we used as explanatory variables what we believe are the main drivers of stock market development and internationalization as identified in the literature, we did not explore all the variables mentioned in previous papers. Others, for example, have identified time zone

²⁷ Karolyi (2004) and Moel (2001) offer evidence on how the use of ADRs is negatively related to local market development. Grammig et al. (2005a,b) investigate how the trading of cross-listed stocks affects the relative importance of price discovery in the home and host markets and find that greater liquidity in the U.S. increases the role for U.S. price discovery. Melvin and Valero-Tonone (2004) find a negative price impact of U.S. cross-listings on home-market rival firms, particularly in emerging market countries. Levine and Schmukler (2006, *in press*) analyze the channels through which internationalization appears to negatively affect domestic market trading activity and liquidity.

differences and similarities in corporate governance and legal framework as affecting the internationalization process. Also, the quality of the home countries' banking system and other financial markets, as well as infrastructure factors (like the efficiency and reliability of clearing systems), may be important elements in determining domestic stock market development and (the degree of) internationalization. Furthermore, there may be specific aspects of the institutional environment that are particularly relevant for domestic market development or for internationalization, something our general indexes of the legal environment do not address. Finally, although we used individual firm level data to estimate our measures of internationalization, we only studied domestic stock market development and internationalization at the country level, and did not study the more micro, individual firm-specific behavior. Clearly, factors such as firm size are likely to affect the degree of internationalization. More research in these directions would be welcomed.

Appendix A

Table 1
List of countries by income level

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	Mexico	Hong Kong
Indonesia	Poland	Ireland
Iran Islamic Republic	Saudi Arabia	Israel
Jamaica	Slovak Republic	Italy
Jordan	South Africa	Japan
Kazakhstan	Trinidad and Tobago	Luxembourg
Kenya	Turkey	Malta
Latvia	Venezuela	Netherlands
Lithuania		New Zealand
Moldova		Norway
Morocco		Portugal
Nigeria		Singapore
Pakistan		Slovenia
Peru		Spain
Philippines		Sweden
Romania		Switzerland
Russia		Taiwan
Sri Lanka		United States
Thailand		
Tunisia		
Ukraine		
Zimbabwe		

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

Table 2

Series description and data sources

Series names	Description	Source
Capital raised abroad (current U.S. dollars)	Capital raised in international markets through depositary receipts or equity issues. Series are computed from firm level data based on two sources: Euromoney and Bank of New York. The first covers all capital raising operations in international markets. The second covers capital raised through depositary receipts. The series are based on Euromoney's information, augmented by depositary receipts operations reported in Bank of New York and not included in Euromoney.	Euromoney and Bank of New York
Capital raised domestically (current U.S. dollars)	Amount of new equity capital raised by domestic firms in the domestic market.	World Federation of Exchanges
Domestic market capitalization (current U.S. dollars)	Market capitalization in domestic stock markets.	Standard & Poor's (former IFC) Emerging Markets Database
Market capitalization of international companies (current U.S. dollars)	Market capitalization of international companies at the end of the year. Series are computed from firm level data, by adding, for each country and year, the market capitalization of all companies with international activity. Companies with international activity are those identified as having at least one active depositary 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, NYSE, or NASDAQ. The series cover the period 1989–2000.	Worldscope, Emerging Markets Database, and Bloomberg
Domestic value traded (current U.S. dollars)	Value traded in the domestic stock market.	Standard & Poor's (former IFC) Emerging Markets Database
Value traded in depositary receipts (current U.S. dollars)	Value traded in depositary receipts covering the period 1989–2000. Series are computed from firm level data by adding all tickers belonging to the same company.	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 average 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 mid-year 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

Table 2 (continued)

Series names	Description	Source
Law and order	Qualitative variable that ranges from one to six, where higher numbers indicate higher “levels” of law and order. Law and order are assessed separately, with each sub-component taking a value between zero and three. 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 three, but a low rating, for example one, if the law is ignored for a political aim, e.g. widespread strikes involving illegal practices.	Political Risk Services: International Country Risk Guide
English legal origin	Dummy that equals one if the origin of the Company Law or Commercial Code of the country is the English Common Law and zero otherwise.	La Porta et al. (1999)
Total equity flows	Sum of foreign direct investment (FDI) and portfolio equity flows. Foreign direct investment includes equity capital, reinvested earnings, other capital, and financial derivatives associated with various intercompany transactions between affiliated enterprises. Portfolio equity flows include transactions in shares and stocks, and similar documents.	IMF: International Financial Statistics
Government deficit	Overall budget balance, defined as current and capital revenue and official grants received, less total expenditure and lending minus repayments. Data are for central government only.	World Bank: World Development Indicators
Capital account liberalization	Dummy that equals one on and after the year of capital account liberalization, and zero elsewhere. 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 a simple dummy variable. In order to splice the two series together to create a series of capital account freedom going back, we use the year-by-year dummy measure up to 1995, and then create a single liberalization dummy after 1996 if at least half of the detailed aspects covered by the IMF signal liberalization.	IMF: Annual Report on Exchange Arrangements and Exchange Restrictions
Stock market liberalization	Dummy that equals one on and after the year of stock market liberalization, and zero otherwise. The liberalization date corresponds to the date of formal regulatory change after which foreign investors officially have the opportunity to invest in domestic equity securities. The liberalization date is based on Bekaert et al. (2005) and Kaminsky and Schmukler (2003) .	Bekaert et al. (2005) and Kaminsky and Schmukler (2003)
Global measure of country growth opportunities	Global measure of country-specific growth opportunities, calculated as the log of the inner product of a vector of global industry price earnings ratios and a vector of country-specific industry weights. Country-specific industry weights are determined by the relative value added of the industries in a country.	Bekaert et al. (in press)

This table shows the description of the data used and their sources. All variables are annual and at the country level. Except when noted, the data cover the period 1984–2000.

Table 3
Summary statistics — stock market development

	1990						2000					
	Market capitalization/GDP						Market capitalization/GDP					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	25	0.437	0.332	1.106	0.129	0.307	28	1.165	0.879	3.770	0.141	0.868
Middle-income countries	10	0.384	0.155	1.228	0.023	0.438	18	0.415	0.290	1.602	0.038	0.419
Low-income countries	18	0.117	0.062	0.498	0.011	0.124	29	0.208	0.142	0.689	0.025	0.177
Total	53	0.318	0.198	1.228	0.011	0.322	75	0.615	0.350	3.770	0.025	0.719
	Value traded/GDP						Value traded/GDP					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	23	0.161	0.105	0.550	0.008	0.162	28	0.998	0.654	3.248	0.026	0.942
Middle-income countries	10	0.081	0.042	0.301	0.006	0.105	17	0.190	0.081	0.899	0.006	0.266
Low-income countries	18	0.030	0.004	0.268	0.000	0.065	29	0.073	0.019	0.668	0.001	0.148
Total	51	0.099	0.044	0.550	0.000	0.136	74	0.450	0.091	3.248	0.001	0.735
	Capital raised domestically/GDP						Capital raised domestically/GDP					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	23	0.015	0.009	0.044	0.002	0.012	28	0.067	0.038	0.465	0.004	0.091
Middle-income countries	7	0.019	0.009	0.079	0.001	0.027	9	0.019	0.013	0.081	0.001	0.024
Low-income countries	1	0.017	0.017	0.017	0.017	.	6	0.012	0.013	0.021	0.001	0.007
Total	31	0.016	0.009	0.079	0.001	0.016	43	0.049	0.024	0.465	0.001	0.078
Memorandum item												
	Value traded/market capitalization						Value traded/market capitalization					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	23	0.400	0.335	1.413	0.008	0.286	28	0.856	0.752	3.972	0.035	0.773
Middle-income countries	10	0.266	0.264	0.687	0.057	0.188	17	0.497	0.362	2.573	0.031	0.630
Low-income countries	18	0.169	0.057	0.958	0.008	0.254	26	0.285	0.139	1.494	0.016	0.378
Total	51	0.292	0.258	1.413	0.008	0.274	71	0.561	0.378	3.972	0.016	0.660

This table shows the summary statistics of market capitalization over GDP, capital raised domestically over GDP, and value traded domestically over GDP at two points in time. Value traded domestically over market capitalization is included as a memorandum item. The country level data are grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). The sources are Standard & Poor's (former IFC) Emerging Markets Database for market capitalization and value traded domestically and World Federation of Exchanges for capital raised domestically.

Table 4

Summary statistics — internationalization of stock markets relative to GDP

	1990						2000					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	23	0.100	0.067	0.347	0.000	0.102	25	0.690	0.521	2.691	0.007	0.661
Middle-income countries	13	0.005	0.000	0.024	0.000	0.009	18	0.152	0.128	0.567	0.000	0.142
Low-income countries	23	0.000	0.000	0.002	0.000	0.000	27	0.040	0.021	0.170	0.000	0.050
Total	59	0.040	0.000	0.347	0.000	0.079	70	0.301	0.120	2.691	0.000	0.495
	Value traded abroad/GDP						Value traded abroad/GDP					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	24	0.006	0.000	0.059	0.000	0.014	25	0.135	0.017	1.431	0.000	0.295
Middle-income countries	17	0.001	0.000	0.020	0.000	0.005	18	0.026	0.003	0.131	0.000	0.040
Low-income countries	30	0.000	0.000	0.000	0.000	0.000	32	0.005	0.000	0.042	0.000	0.011
Total	71	0.002	0.000	0.059	0.000	0.009	75	0.053	0.002	1.431	0.000	0.179
	Capital raised abroad/GDP						Capital raised abroad/GDP					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	25	0.001	0.000	0.024	0.000	0.005	26	0.012	0.006	0.085	0.000	0.019
Middle-income countries	17	0.000	0.000	0.003	0.000	0.001	18	0.002	0.000	0.013	0.000	0.004
Low-income countries	30	0.000	0.000	0.000	0.000	0.000	32	0.001	0.000	0.020	0.000	0.004
Total	72	0.001	0.000	0.024	0.000	0.003	76	0.005	0.000	0.085	0.000	0.012

This table shows the summary statistics of market capitalization of international firms over GDP, value traded abroad over GDP, and capital raised abroad over GDP at two points in time. The country level data are grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). Market capitalization of international firms is computed by aggregating firm level data from Standard & Poor's (former IFC) Emerging Markets Database, Worldscope, and Bloomberg. Value traded abroad is computed by aggregating firm level data from Bank of New York. Capital raised abroad is computed by aggregating firm level data from Bank of New York and Euromoney.

Table 5

Summary statistics — internationalization of stock markets relative to domestic activity

	1990						2000					
	Market capitalization of international firms/ total market capitalization						Market capitalization of international firms/ total market capitalization					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	21	0.252	0.183	0.853	0.000	0.214	25	0.562	0.549	1.068	0.032	0.270
Middle-income countries	8	0.032	0.000	0.190	0.000	0.066	18	0.430	0.486	0.826	0.000	0.253
Low-income countries	15	0.001	0.000	0.012	0.000	0.003	27	0.179	0.114	0.820	0.000	0.194
Total	44	0.126	0.013	0.853	0.000	0.192	70	0.380	0.384	1.068	0.000	0.289
	Value traded abroad/value traded domestically						Value traded abroad/value traded domestically					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	20	0.404	0.003	7.464	0.000	1.663	25	0.309	0.030	2.580	0.000	0.701
Middle-income countries	10	0.032	0.000	0.271	0.000	0.085	17	0.422	0.006	2.177	0.000	0.720
Low-income countries	18	0.000	0.000	0.000	0.000	0.000	28	0.071	0.000	1.421	0.000	0.268
Total	48	0.175	0.000	7.464	0.000	1.076	70	0.241	0.009	2.580	0.000	0.584
	Capital raised abroad/capital raised domestically						Capital raised abroad/capital raised domestically					
	No. of obs.	Mean	Median	Max	Min	Std. dev.	No. of obs.	Mean	Median	Max	Min	Std. dev.
High-income countries	21	0.075	0.026	0.761	0.000	0.166	26	0.281	0.163	1.087	0.000	0.324
Middle-income countries	7	0.064	0.000	0.351	0.000	0.132	9	0.650	0.313	2.391	0.000	0.825
Low-income countries	1	0.000	0.000	0.000	0.000	.	6	0.013	0.000	0.077	0.000	0.031
Total	29	0.070	0.013	0.761	0.000	0.154	41	0.323	0.142	2.391	0.000	0.491

This table shows the summary statistics of market capitalization of international firms over the total market capitalization, value traded abroad over value traded domestically, and capital raised in international markets over capital raised domestically at two points in time. The country level data are grouped by income level, following the classification of the World Development Indicators, World Bank (see Appendix Table 1). The sources are Standard & Poor's (former IFC) Emerging Markets Database for market capitalization and value traded domestically and World Federation of Exchanges for capital raised domestically. Market capitalization of international firms is computed by aggregating firm level data from Standard & Poor's (former IFC) Emerging Markets Database, Worldscope, and Bloomberg. Value traded abroad is computed by aggregating firm level data from Bank of New York. Capital raised abroad is computed by aggregating firm level data from Bank of New York and Euromoney.

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