

Migration, Spillovers, and Trade Diversion: The Impact of Internationalization on Domestic Stock Market Activity

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Abstract

This paper studies the relation between internationalization (firms cross-listing, issuing depositary receipts, or raising capital in international stock markets) and the trading activity of the remaining firms in domestic markets. Using a panel of 3,000 firms from 55 emerging economies during 1989-2000, we find that internationalization is negatively related to the trading activity of domestic firms. We identify two channels. First, the trading of international firms migrates from domestic to international markets and this migration along with the reduction in domestic trading of international firms has negative spillover effects on domestic firm trading activity. Second, there is trade diversion within domestic markets as trading activity shifts out of domestic firms and into international firms.

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I. Introduction

What is the impact of firms that participate in international stock markets on the trading activity of the remaining firms in the domestic market? We address this question by studying the effects of firms becoming “international” (by participating in international equity markets through issuing depositary receipts, cross-listing, or raising new capital) on the trading activity of “domestic firms” (the firms that do not internationalize).¹ Understanding the effects of internationalization on trading activity is important because domestic market trading affects the growth rate and performance of firms, industries, and the overall economy.²

To study the effects of internationalization, we use trading information on over 3,000 firms across 55 emerging market countries during the years 1989 to 2000. We measure trading activity using turnover, which equals the value of a firm’s transactions in a market divided by the firm’s market capitalization. Turnover, and similar trade-based indicators, are frequently used to proxy for liquidity since (i) theory and evidence suggest a close association between turnover and bid-ask spreads, (ii) many countries do not have bid-ask spread information (especially time series data), and (iii) some research finds that turnover can be a better proxy for liquidity than bid-ask spreads due to problems with measuring spreads.³ We measure the country-level degree of internationalization by the share of international firms in a country in a given year.

¹ Various publications has voiced concerns of markets becoming illiquid as internationalization has progressed (e.g., Bovespa, 1996; Financial Times, 1998; Latin Finance, 1999, 2004; Federation des Bourses de Valeurs, 2000; and The Economist, 2000;).

² Theory predicts a positive link between trading activity and both firm and national growth (Bencivenga, Smith, and Starr, 1995 and Levine, 1991). On the empirical side, Amihud and Mendelson (1986) estimate that a one percentage point increase in the bid-ask spread is associated with 0.2 of a percentage point increase in the monthly risk-adjusted excess return. Levine and Zervos (1998a) find that a one standard deviation increase in domestic market turnover boosts steady-state real per capita annual economic growth by 0.8 percentage points, which is large considering that the average per capita growth rate in their sample is less than two percentage points per year. Also see Beck and Levine (2002, 2004) and Demirguc-Kunt and Maksimovic (1998).

³ From a theoretical perspective, Stoll (1978a) and Amihud and Mendelson (1986) suggest a direct link between trading costs and trading volume and holding periods, respectively. Empirically, Stoll (1978b) and Atkins and Dyl (1997) confirm these predictions. Petersen and Fialkowski (1994) demonstrate the problems with computing accurate bid-ask

By providing empirical evidence on how internationalization is related to domestic trading activity, we shed light on different theories that yield conflicting predictions on the effects of internationalization. Consider first the “migration and spillovers” argument. According to the migration view, internationalization will induce a shift in the trading of international firms out of the domestic market and into major international financial markets. This may occur because major international markets have lower information and transaction costs (Lang, Lins, and Miller, 2003, 2004; Chowdhry and Nanda, 1991). Spillovers mean that a drop in the domestic trading of international firms hurts the trading and liquidity of domestic firms. Indeed, using data from the United States, Chordia, Roll, and Subrahmanyam (2000) find that liquidity is not simply an asset-specific attribute; rather, individual asset liquidity tends to co-move with aggregate market liquidity. Spillovers could occur because of fixed costs associated with operating a market, running brokerage firms, clearing and settling transactions, among other things. Thus, a drop in the domestic trading of international stocks could increase the per-trade cost of domestic stock transactions and reduce the trading and liquidity of domestic firms.⁴ Combined, migration and spillovers imply that internationalization reduces the trading activity and liquidity of domestic firms.

Some disagree with the migration and spillovers view and instead argue that internationalization improves the domestic market. In contrast to the migration view, Hargis (2000) argues that cross-listing can transform a segmented equity market with low liquidity into an

spreads. Consequently, a large number papers use turnover and volume based proxies of liquidity (e.g., Haugen and Baker, 1996; Brennan, Chordia, and Subrahmanyam, 1998; Datar, Naik, and Radcliffe, 1998; Rouwenhorst, 1999). Levine and Schmukler (2006) find that alternative measures of liquidity based on price changes are highly correlated with turnover.

⁴ Spillover-like effects can also occur if internationalization induces investors to shift their trading out of domestic markets and into major international markets. For example, investors may seek to diversify country-specific risk. Thus, when some firms cross-list or issue depositary receipts in international markets, investors may attain country-specific diversification through these liquid international markets and therefore reduce their trading in domestic markets. International investors may prefer to trade in major international markets rather than local markets because of lower settlement risks (Velli, 1994), more efficient pricing of risk (Patro, 2000), and lower information costs (Lang, Lins, and Miller, 2003, 2004). Indeed, Ahearne, Grier, and Warnock (2004) and Edison and Warnock (2004) show that U.S. investors focus on firms that have internationalized. From another perspective, Sarkissian and Schill (2004) show that market proximity and other familiarity factors play dominant roles in the choice of overseas listing venue.

integrated market with high trading activity and liquidity. Similarly, Alexander, Eun, and Janakiramanan (1987) and Domowitz, Glen, and Madhavan (1998) hold that internationalization may actually stimulate domestic trading of international firms due to the increased integration of markets. Also, if internationalization increases transparency, this could increase the domestic trading of international firms with positive spillover effects for the rest of the domestic market (Hargis and Ramanlal, 1998). Other skeptics of the migration-spillovers view could question the existence and magnitude of spillovers. Thus, it is an empirical question as to whether internationalization induces migration and spillovers, or whether internationalization boosts the trading activity of domestic firms.

Second, consider the “domestic trade diversion” view, which argues that internationalization induces a compositional shift in domestic market trading. Firms that internationalize may become more attractive to traders in the domestic market if internationalization induces improvements in reputation, disclosure standards, analyst coverage, and the shareholder base.⁵ Thus, traders in the domestic market may shift their trading out of domestic firms and into the domestic trading of international firms. All else equal, this domestic trade diversion implies less trading of domestic firms and greater trading of international firms in the domestic market.

Some theories, however, conflict with the trade diversion view and instead argue that internationalization may enhance integration and thereby boost liquidity of domestic firms (e.g., Alexander, Eun, and Janakiramanan, 1987; Domowitz, Glen, and Madhavan, 1998; Hargis, 2000). This could occur because integration increases the liquidity of all firms in the local markets. Moreover, integration may induce a compositional shift in domestic trading toward domestic firms as the trading of international firms migrates abroad. Again, theory provides conflicting predictions

⁵ See Baker, Nofsinger, and Weaver (2002), Portes and Rey (2005), and Reese and Weisbach (2002).

about the impact of firms that choose to internationalize on domestic firms, which in turn motivates this paper's empirical inquiry.

The paper first finds that as more firms become international, the turnover of domestic firms diminishes. Next, the paper studies the channels through which international firms can affect the turnover of domestic firms. There is evidence of migration: as the fraction of international firms rises, the trading of international firms shifts from domestic markets to international markets. Furthermore, we find evidence of spillovers: the domestic trading of international shares is strongly, positively related to the turnover of domestic firms. Hence, the data are consistent with the migration and spillovers view: as the turnover of international firms in the domestic market dries up because of migration, the turnover of domestic firms diminishes because of spillovers.

Furthermore, besides the migration and spillover channel, we find evidence supporting the domestic trade diversion channel. The data suggest that as firms internationalize, the domestic market intensifies its trading of those international shares, while trading of firms that do not internationalize wanes. This does not overturn the finding that internationalization reduces the domestic turnover of international shares. The trade diversion result is consistent with, albeit not an unambiguous proof of, theories that emphasize that when a firm internationalizes this enhances its reputation, transparency, and shareholder base in ways that make it more attractive relative to domestic firms. In sum, domestic trade diversion is another mechanism through which internationalization reduces the turnover of firms that do not internationalize.

Our work provides several contributions to two recent examinations of the association between the fraction of a country's stocks that issue American Depositary Receipts (ADRs) and domestic market turnover (Moel, 2001, and Karolyi, 2004). First, we study the channels through which internationalization influences the turnover of domestic stocks, evaluating the importance of

the migration-spillovers and trade diversion channels. Second, we substantially expand the sample size. Third, we measure the main explanatory variable more broadly, by moving beyond the depositary receipt market in New York to include depositary receipts, cross-listings, and private placements in New York and other financial centers. Fourth, we incorporate time-varying data on the international trading activities of international firms. This allows us to estimate more precisely the impact of internationalization on domestic equities because we control for country-specific news that influences global trading of that country's shares, while also obtaining separate estimates of international trading on the domestic market. Fifth, to further isolate the marginal impact of internationalization, we control for firm-specific characteristics, including firm size, which existing studies do not. Our paper also contributes to the more established literature on international firms, since we examine the impact of firms that internationalize on both (a) the trading of international firms in the domestic market and (b) the trading of domestic firms. This large literature studies the impact of internationalization on various characteristics of international firms.⁶

The rest of the paper is organized as follows. Section II discusses the data. Section III discusses the econometric methodology and presents the results. Section IV concludes.

⁶ Our work also relates to other strands of the international finance literature. Several papers analyze the impact of market integration. Some papers examine the volume and liquidity of international firms in local markets after firms cross-list or issue depositary receipts, e.g., see Hargis (1998) and Noronha, Sarin, and Saudagaran (1996). Other researchers study the impact of internationalization on stock prices, the cost of capital, and growth opportunities, e.g., see Alexander, Eun, and Janakiramanan (1988), Errunza and Miller (2000), Foerster and Karolyi (1999) and Miller (1999). A related line of research analyzes the effect of internationalization on asset size, growth, financing constraints, and the financial structure of firms that issue depositary receipts or cross-list, e.g., see Patro and Wald (2005) and Schmukler and Vesperoni (2006). Finally, Gozzi, Levine and Schmukler (2006) examine whether internationalization increases the market value of these internationalizing firms. For more general effects of internationalization, see for example, Bekaert, Harvey, and Lundblad (2005), Henry (2000), Levine and Zervos (1998a,b), and Martin and Rey (2000).

II. Data

To assess the impact of internationalization on domestic stocks, we need the following data:

1. Firm-level data on the international equity activities of firms, including
 - a. Dates of capital raisings, cross-listing, and depositary receipt issuance,
 - b. International trading data,
2. Firm-level data on domestic stock transactions,
3. Firm-level data on a range of firm attributes, and
4. Country-specific data on macroeconomic, institutional, and financial conditions.

An important contribution of this paper is that we use considerably more data on the international equity market activities of companies than past studies. The data for identifying each firm's international activities come from two main sources: the Bank of New York and Euromoney.

Besides the Bank of New York's standard database (the Complete Depositary Receipt Directory) that contains information on current depositary receipt activities, the Bank of New York gave us access to their historical databases and reports on (i) depositary receipt program initiation dates, (ii) termination dates (if any), (iii) capital raisings, and (iv) trading activities. These data form a comprehensive database on American and Global depositary receipt programs. The historical data start in January 1956, but most programs begin after 1980.

We augment the information on dating the initiation of international equity market activities with data from Euromoney, the London Stock Exchange (LSE), NASDAQ, and the New York Stock Exchange (NYSE). Euromoney provides the dates when firms raise equity capital in international markets, including cross-listings and issuance of global depositary receipts. Thus, the Euromoney data substantively enhance the identification of international firms. The Euromoney database covers 8,795 cross-border equity issuance and cross-listing operations from 5,665 firms in 86 countries over the period January 1983 - April 2001. LSE, NASDAQ, and NYSE provide information on listing dates by foreign corporations.

In terms of trading abroad, we focus on trading in ADRs. The dataset on ADR value traded also comes from Bank of New York and covers the period 1989-2000, providing the value traded in U.S. dollars. Companies that are not shown to be trading according to Bank of New York are assigned a zero. See the working paper version of this paper, Levine and Schmukler (2003), for more discussion on the availability of trading data from the LSE and the Frankfurt Stock Exchange (FSE). Also see Claessens, Klingebiel, and Schmukler (2002) for a description of some trends on the internationalization of stock markets as well as their relation to country characteristics.

Consistent with our objective of using a broad database on internationalization, we classify firms as international if they (1) issue depositary receipts, (2) cross-list, or (3) raise capital through private placements abroad. The first two clearly involve ongoing trading of domestic stocks in foreign countries. However, raising capital through private placements is different because the new shares are not necessarily traded abroad. Thus, the issuing of depositary receipts and cross-listing may involve the two potential channels discussed in the Introduction: migration/spillovers and trade diversion. Raising capital abroad in the absence of cross-listing, however, will only potentially involve trade diversion in the domestic market since simply raising capital abroad cannot induce migration. As noted below, we confirm this paper's findings with various sub-samples.

The firm-level domestic stock market trading and capitalization data are from the Standard & Poor's Emerging Markets Data Base (EMDB). In cross-checking with country sources, we found some inconsistencies in the data for Argentina and corrected it using data from the Buenos Aires Stock Exchange. Although the EMDB is the most comprehensive database on equity transactions, the EMDB focuses on emerging markets and does not include 100 percent of local firms (i.e., while varying by country, the EMDB typically covers about 70 percent of market capitalization).

We also use balance sheet data on each firm to control for firm-specific characteristics that may influence liquidity. Thus, we control for industry effects, firm size, and firm sales in assessing the impact of internationalization on the liquidity of firms in the domestic market. For simplicity, in the results discussed below, we present the results controlling for firm size, but the results are robust to controlling for the other firm-specific effects. We obtain these data from the Worldscope database (Thomson Financial Company).

The firm-level data on domestic stock market trading, the firm-level balance sheet information, and international equity activities are all matched at the firm level over the period 1989-2000. Appendix Table 1 lists the 55 countries in the study and the number of domestic and international firms per country, as well as summary statistics of some of the variables used in the analysis. Some countries do not have any international firms. We keep these in the sample as a control group, but emphasize that this paper's results hold when we exclude countries with zero or only one international firm. We have over 16,000 firm-year observations. Appendix Table 2 provides additional information on data sources.

For robustness, we control for time-varying country-specific information and country dummy variables. Data are from the World Bank's World Development Indicators. Data on the efficiency of each country's legal system are obtained from the International Country Risk Guide (Political Risk Services). Information on official restrictions on international capital flows is from the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions. We also control for economic growth, inflation, real interest rates, terms of trade changes, time trend, and alternative measures of capital account openness that we describe below.

III. Methodology and Results

This section examines the impact of firms that internationalize (firms that issue depositary receipts, cross-list, or raise equity capital abroad) on domestic firms (firms that do not internationalize). To do this, we first examine whether internationalization is directly related to the turnover of domestic firms. Second, we examine whether internationalization affects domestic turnover through the migration and spillovers channel. Third, we test whether internationalization induces trade diversion, i.e., does internationalization divert the composition of trading in the local stock market out of domestic firms and into international firms?

A. Direct Effect on Turnover

1. *Method*

To examine whether internationalization is directly related to the turnover of domestic equities, we estimate the following regression using ordinary least squares with standard errors adjusted for clustering at the firm level.

$$T_{j,c,t}^D = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (1)$$

$T_{j,c,t}^D$ is the logarithm of one plus the turnover ratio of domestic firm j in country c in year t , where the turnover ratio equals the total value of trades of firm j 's stock during year t divided by firm j 's market capitalization.⁷ For brevity in the text, we refer to $T_{j,c,t}^D$ as the turnover of domestic firms. The superscript D designates that it is a domestic firm during the entire sample period, i.e., it never internationalizes. We define the dependent variable in this way because we want to examine the effects of internationalization on the firms that rely on the domestic market throughout the sample period. By focusing on those firms that never access international capital markets, we test

⁷ We use this transformation because the total value of trades is sometimes zero. An alternative measure of trading activity is the number of shares traded in one year divided by the number of shares outstanding. This measure abstracts from price changes. But, it is impossible to aggregate usefully across different stocks to obtain country-level liquidity measures, which we need in order to assess spillovers.

how their turnover changes as other firms internationalize. In all regressions, we control for country and time effects (n_c and τ_t respectively), but do not report these in the tables to save space.

$IS_{c,t}$ is the share of international firms in country c at time t . Thus, $IS_{c,t}$ is the number of international firms from country c at time t divided by the total number of firms listed in the domestic market for country c at time t . In computing $IS_{c,t}$, a firm is considered an international firm from the year it issues a depositary receipt, cross-lists, or raises equity capital abroad. If, however, the firm terminates its depositary receipt listing or de-lists from an international exchange, then the numerator of $IS_{c,t}$ falls by one.⁸

$IT_{c,t}^I$ is the aggregate turnover ratio of country c 's international firms in international equity markets at time t . Thus, $IT_{c,t}^I$ equals the aggregate value traded of all of country c 's international firms in international markets divided by the market capitalization of those international firms.

We include the variable $IT_{c,t}^I$ to control for trading of country c 's equities on international exchanges. Information about a country's political and economic conditions may induce trading of that country's stocks in both international and domestic markets. This effect would be captured by a positive coefficient on $IT_{c,t}^I$. To abstract from time-varying country-specific factors influencing trading, we include the trading of country c 's stocks in international markets in regression (1).

$M_{c,t}$ is a matrix of macroeconomic and country-specific control variables. We include gross domestic product (GDP) per capita since the level of economic development may influence financial market development (Levine, 2005). We also include an index of the law and order tradition of the economy since the operation of legal systems may influence equity market development and cross-listing decisions (Beck, Demirguc-Kunt, and Levine, 2003; Pagano, Randl,

⁸ Since firms can list abroad without listing in the domestic markets, this ratio could, in theory, be larger than one.

Roell, Zechner, 2001). Furthermore, we control for the openness of the capital account to international capital flows (using data from the International Monetary Fund) since international financial integration may influence the liquidity of domestic equity markets. We incorporate the macroeconomic and country-specific control variables because we want to assess the independent impact of internationalization on domestic turnover.

$F_{j,c,t}$ includes firm-specific characteristics in country c during year t . We control for company level traits to assess the independent impact of internationalization on the trading of firms in the domestic market. In the tables, we include the logarithm of the total assets in U.S. dollars. In robustness checks discussed below, we control for many other firm characteristics.

2. Results on the direct effect

Contrary to a variety of theoretical models discussed in the Introduction, the Table 1 results indicate that internationalization is negatively associated with the turnover of domestic firms. In particular, the coefficient on the share of international firms in country c at time t , γ_1 , is negative and significant at the one-percent level across all of the specifications that control for different combinations of regressors. In terms of the other regressors, we find a strong link between the trading of international firms in international markets and the turnover of domestic stocks. Put differently, trading of country c 's international stocks on international exchanges ($IT_{c,t}^I$) is robustly related with the turnover of domestic stocks. Also, rich countries and countries with a strong law and order tradition tend to have domestic firms with greater turnover. Finally, we see that the variable total assets enters with a negative coefficient. The reason for the negative coefficient is that total assets is closely linked with market capitalization, which is the denominator of the dependent variable. As we will see below however, when we compare the trading of stocks within a country, the equities of bigger companies trade more than those of smaller companies. In sum, as the share of

international firms in an economy rises – i.e., as the fraction of firms in an economy that issue depositary receipts, cross-list, or raise capital abroad rises – the turnover of remaining firms falls.

The adverse impact of internationalization on the turnover of domestic firms is economically relevant. For instance, consider the last regression coefficient based on the regression with all of the regressors included (-2.6). This estimate implies that a one-standard deviation increase in the share of international firms (0.05) will cause the turnover of domestic firms (measured as the log of one plus turnover) to fall by -0.13. This is substantial given that the mean of this variable is 0.51, so that a one-standard deviation increase in internationalization reduces domestic firm turnover by 25 percent of the sample mean.⁹

Some caution, however, is needed in interpreting these initial results. Some may argue that the results simply reflect the possibility that firms that internationalize are good firms and firms that do not internationalize are comparatively poor. While potentially true, this would not negate the value of the Table 1 results. First, some theories discussed in the Introduction suggest that internationalization boosts domestic turnover by making markets more integrated. We find no evidence for this. Second, we confirm the Table 1 results when controlling for many firm-specific traits (as discussed below). Thus, even when controlling for firm quality, we get the same result. Third, the argument that bad firms remain domestic does not necessarily predict that trading in those firms will diminish as good firms become international, which is what we find in Table 1. Fourth, we obtain the same results even when we restrict the sample to firms that trade for the entire sample period. Thus, uncompetitive firms that become inactive and drop out of the sample do not drive the results. Fifth, as we show below, the results indicate that the turnover of international firms in the domestic market falls with internationalization, which is inconsistent with a simple

⁹ Of course, this type of experiment is only for illustrative purposes. A one standard deviation change is not a marginal change and we do not specify what drives the change in internationalization.

story that international firm turnover thrives while domestic firm turnover falls. An additional weakness with the results thus far is that we do not provide information on the mechanisms linking internationalization to domestic firm turnover. Although regression (1) provides information on the direct impact of internationalization on the turnover of domestic firms, it does not provide information on the channels through which internationalization affects the turnover of domestic firms. We turn to this now.

B. Turnover and the Migration and Spillovers Channel

The migration and spillovers view predicts a two-stage channel through which internationalization may influence the turnover of domestic stocks. First, internationalization may reduce the domestic trading of international firms as the trading of international firms migrates to more liquid, lower cost international markets. Second, migration and the reduction in trading of international firms in domestic markets may hurt the turnover of domestic firms because of spillovers. Taken together, migration and spillovers provide an explanation of how internationalization might reduce the turnover of domestic firms. As discussed in the Introduction, theoretical debate exists on each of these two mechanisms that define the migration and spillovers channel. We assess empirically each of these channels.

1. The migration part of the migration-spillovers channel

To examine the migration component of the migration and spillovers channel we use three different regression specifications. Consider first the simple specification that assesses the impact of internationalization on the domestic turnover of international firms.

$$T_{j,c,t}^I = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (2)$$

$T_{j,c,t}^I$ is the logarithm of one plus the turnover ratio of international firm j in country c in year t . The superscript I designates that it is an international firm, which is a firm that has either issued a depositary receipt, cross-listed, or raised equity capital abroad at some point in the sample. For brevity in the text, we refer to $T_{j,c,t}^I$ as the domestic turnover of international firms. In these first analyses, we simply split the sample between firms that never internationalize and firms that become international at some point in the sample. Below, we will assess the impact of an individual firm's decision to internationalize on its trading activity within the domestic market.

$IT_{j,c,t}^I$ is the aggregate turnover ratio of country c 's international firms in international equity markets at time t , excluding the trading of company j . The other variables are the same as those in equation (1).

Table 2 provides strong evidence that internationalization exerts a negative impact on the domestic turnover of international firms. The coefficient on $IS_{c,t}$ always enters significantly and negatively. As in Table 1, we control for the international trading of international firms ($IT_{j,c,t}^I$). We do this to control for other factors influencing the trading of that country's equities. $IT_{j,c,t}^I$ enters positively, which indicates a positive link between the trading of a country's stocks abroad and the trading of those international firms in the local market. In sum, after controlling for many factors, we find that as a country's firms internationalize this negatively influences the domestic turnover of international firms.

The results suggest an economically large impact. A one-standard deviation increase in internationalization reduces the domestic turnover of international firms (measured as the log of one plus turnover) by about 0.12 (2.4×0.05). This translates into a reduction of the domestic turnover of international firms of 29 percent of the sample mean.

The second regression we use to examine the migration component of the migration and spillovers channel controls for the domestic turnover of international firms in addition to the international turnover of international firms. Thus, to assess the independent impact of the share of international firms in a country on the domestic turnover of individual international firms we now control for the aggregate turnover of international firms in both international and domestic markets.

Specifically, we estimate equation (3).

$$T_{j,c,t}^I = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \beta \times T_{j,c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (3)$$

$T_{j,c,t}^I$ is the aggregate domestic turnover ratio of international firms, excluding the trading of company j.

Table 3 shows that internationalization lowers the domestic turnover of international firms, i.e., there is a negative and significant coefficient on $IS_{c,t}$. Thus, even when controlling for many factors, the domestic turnover of international firms falls as the share of firms in the economy with international equity market operations rises.

The Table 3 results provide some preliminary evidence on spillovers. The coefficient on $T_{j,c,t}^I$ enters positively and significantly. Thus, aggregate trading of international firms in the local market positively influences the trading of individual international firms in the local market.

The third regression we employ to test for migration examines the relative trading of an international firm in international and domestic markets. Thus, we examine whether the fraction of trading of an international firm shifts from domestic to international markets as more firms internationalize. So far, we have examined the impact of internationalization on the level of the domestic trading of international firms. But the domestic turnover of international firms can be influenced by several factors, including how attractive an international company is relative to other

companies. Therefore, a more direct method for studying migration is to analyze the share of the company's turnover in the domestic market relative to its total turnover.

Thus, we estimate the following regression for international firms.

$$\frac{T_{j,c,t}^I}{T_{j,c,t}^I + IT_{j,c,t}^I} = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \beta \times T_{j,c,t}^I + \theta^I M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (4)$$

The dependent variable in this equation measures the level of domestic turnover of firm j relative to firm j's total turnover, which includes the domestic turnover of firm j and the international turnover of firm j. Since the market capitalization is the same in the numerator and denominator, this measure is equivalent to using the ratio of value traded in the domestic market to total value traded. Importantly, we control for the aggregate turnover of country c's international firms, excluding firm j. Thus, we control for the aggregate turnover of firm j's markets when assessing the impact of internationalization on whether the trading of firm j shifts abroad.

Table 4 presents regressions that are consistent with migration. There is a negative and significant coefficient on $IS_{c,t}$. This indicates that internationalization (an increase in the share of international firms in the domestic market) reduces the proportion of trading of international firms in domestic markets. Economically, the effect is not inconsequential. According to the coefficient estimates, a one standard deviation increase in internationalization (0.05) reduces the proportion of trading of international firms in domestic markets (measured as the log of one plus the proportion of trading) by about eight percent of the sample mean ($([-0.998 \times 0.05] / 0.65) \times 100$). As above, we control for many factors, including the turnover of country c's stocks ($IT_{j,c,t}^I$) in international markets and also the domestic turnover of country c's international firms ($T_{j,c,t}^I$).

Table 4 also provides evidence consistent with the existence of spillovers. $T_{j,c,t}^I$ has a positive and significant coefficient, which holds while controlling for the turnover of country c's

international stocks in international markets ($IT_{j,c,t}^I$). Thus, aggregate turnover influences the turnover of individual stocks.

2. *The spillover part of the migration and spillovers channel*

Next, we further examine spillovers. Does aggregate trading in a market influence the turnover of individual domestic stocks? If there is migration – if internationalization induces a shift in the trading of international firms from domestic to international markets – and if there are spillovers, then this represents a two-part channel through which internationalization affects the trading activity of domestic firms.

Besides the evidence discussed above on whether aggregate turnover influences the trading of international firms in the local market, we estimate an extension of equation (1) that focuses on the turnover of domestic firms.

$$T_{j,c,t}^D = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{c,t}^I + \beta \times T_{c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (5)$$

The difference between equation (1) and equation (5) is that equation (5) controls for the aggregate liquidity of international firms in the domestic market. Specifically, $T_{c,t}^I$ equals the domestic turnover of international firms in country c at time t .

Table 5 provides positive evidence of large spillovers. There is a positive and significant coefficient on $T_{c,t}^I$ in all of the specifications. The aggregate turnover of international firms in the domestic market positively influences the turnover of individual domestic firms above and beyond (i) the aggregate turnover of international firms in international markets ($IT_{c,t}^I$), (ii) the degree of internationalization ($IS_{c,t}$), (iii) macroeconomic and country-specific controls ($M_{c,t}$), (iv) firm-specific traits ($F_{j,c,t}$), and (v) country and time effects (n_c and τ_t respectively). The impact is economically large. A one standard deviation decrease in the domestic turnover of international

firms (0.46) translates into a reduction of 0.13 in domestic firm turnover (-0.46×0.29). Since the sample mean value of turnover of domestic firms is 0.51, this implies that a one-standard deviation drop in international firm turnover in the domestic market lowers domestic firm turnover by 26 percent of the sample mean. These spillover results confirm and extend research from U.S. markets (Chordia, Roll, and Subrahmanyam, 2000). Across 55 markets during the years 1989-2000, we find that an individual equity's turnover reflects the market's overall level of activity after controlling for firm-specific and country-specific factors.

The regression results presented in Tables 2-5 are consistent with the migration and spillovers channel. We find that (a) internationalization reduces the domestic turnover of international firms and (b) the domestic turnover of international firms exerts a positive impact on the turnover of domestic firms. Taken together, these results imply that internationalization hurts the turnover of domestic firms through the migration and spillovers channel.

The migration and spillovers channel is not the whole story. In Table 5 when we control for the turnover of international firms in the domestic market, $IS_{c,t}$ still enters negatively and significantly. The turnover of domestic firms is negatively influenced by the share of international firms in a market, beyond the effects of the aggregate trading of international firms in the domestic economy ($T_{c,t}^I$) and in international markets ($IT_{c,t}^I$), and after controlling for country-specific and firm-specific factors. If the migration-spillovers channel were the only channel through which internationalization affected the turnover of domestic stocks, then $IS_{c,t}$ should enter insignificantly after controlling for the spillovers channel. The fact that $IS_{c,t}$ remains significant suggests that internationalization is influencing domestic turnover through an additional mechanism.

C. The Trade Diversion Channel

1. *Method*

Trade diversion is an additional channel through which internationalization can influence the trading activity of domestic stocks. We assess whether internationalization induces a compositional shift in domestic market trading, out of domestic stocks and into the trading of international stocks. More specifically, does the proportion of the overall turnover of the domestic stock market accounted for by a particular firm rise simply because it becomes an international firm?

To study the trade diversion channel, we estimate the following equation:

$$S_{j,c,t} = \phi_1 \times I_{j,c,t} + \phi_2 \times IT_{j,c,t}^I + \theta' M_{c,t} + \kappa \times MCap_{j,c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t}. \quad (6)$$

$S_{j,c,t} = \frac{T_{j,c,t}}{T_{c,t}^{D+I}}$ is firm j 's share of turnover in country c in year t relative to the total turnover of country c 's domestic stock market in year t , where total turnover includes the domestic trading of both domestic and international firms. We also used value traded instead of the turnover ratio and obtained similar results.

$I_{j,c,t}$ is a dummy variable that equals one if the company is international and zero otherwise.

Note that this dummy turns from zero to one when a firm internationalizes.

$IT_{j,c,t}^I$ is the international trading of company j and equals zero for domestic firms.

$MCap_{j,c,t}$ is the market capitalization of firm j . We include this variable to control for the fact that the share of turnover in firm j might tend to rise when the price of the stock rises or when the number of shares outstanding increases.¹⁰

¹⁰ In the previous specifications, we do not include market capitalization among the independent variables because the dependent variables are already scaled by market capitalization.

Finally, we continue to control for the trading of international firms in international markets. We do this to control for as many firm- and country-specific factors as possible and focus on the marginal impact of internationalization on the proportion of domestic turnover accounted for by international firms.

2. Results on the trade diversion channel

The Table 6 results indicate that internationalization reduces the proportion of turnover of domestic firms in the local market through the trade diversion channel. The coefficient, ϕ_I , on $I_{j,c,t}$ enters with a positive coefficient in all of the Table 6 specifications. Thus, the proportion of the overall turnover of the domestic stock market accounted for by a particular firm rises simply because it becomes international. Indeed, the coefficients indicate that internationalization raises an individual firm's share of domestic turnover by at least 10 percent of the average firm's share of domestic turnover. Furthermore, note that the size of a company (total assets) is positively associated with the share of turnover of that company in the local market. In sum, the results are consistent with the view that internationalization induces a compositional shift in the local market toward comparatively less trading of domestic stock and greater turnover of international stocks.

As noted in the Introduction, alternative theories predict trade intensification, not trade diversion. These alternative views hold that internationalization will induce more active trading of domestic stocks, not less. In contrast, our results support the view that internationalization induces trade diversion. As firms internationalize, the domestic market becomes more focused on trading those international companies.

D. Robustness Tests

We subjected these results to six categories of sensitivity checks.

First, we experimented with three different approaches to defining internationalization. First, instead of basing the *IS* indicator on the number of firms becoming international, we computed an internationalization measure based on the value traded of the international firms. We confirmed this paper's findings.

The next approach to defining internationalization assesses the particular mechanisms through which a company internationalized. Thus, we examined separately (i) firms that internationalized through a public offering and (ii) firms that internationalized through a private placement. If a company first does a private placement and then a public placement, it is considered public after the public placement. Note that while public placements clearly involve ongoing trading of domestic stocks in foreign countries, raising capital through private placements is different because the new shares are not necessarily traded abroad. Thus, public offerings abroad may involve migration/spillovers and trade diversion. Raising capital abroad in the absence of cross-listing, however, will only potentially involve trade diversion in the domestic market since simply raising capital abroad cannot induce migration of trading abroad. We confirm all of this paper's results for public placements and the results on trade diversion for private placements.

Furthermore, we examined the different types of ADR programs. This is problematic, however. One of this paper's contributions is to obtain more precise indicators of internationalization that extend beyond the ADR market. Thus, when we use these subcategories we are not using a comprehensive definition of internationalization. We confirm all this paper's findings for the Level I programs (depository receipts traded in the over-the-counter, OTC public markets) and Level II and III programs (depository receipts listed on a U.S. exchange and those sold

in a public offering, respectively). When using the Regulation 144A private placements in the U.S., since these shares are sold to qualified institutional buyers and trade on the PORTAL system with very limited liquidity, we can only assess the trade diversion effect. In sum, when we define internationalization only as public placements, we confirm this paper's results; when we define internationalization only as private placements, we confirm this paper's results on trade diversion; when we define internationalization only as Level I ADR programs, we confirm this paper's results; when we define internationalization as only Level II and III ADR programs, we confirm this paper's results; and, when we define internationalization only as 144A private placements, we confirm this paper's results on trade diversion.

The last approach to re-defining internationalization excludes firms that raise private capital in international markets and do not issue depositary receipts or cross-list. These cases are only a small proportion (less than 10 percent) of the internationalization episodes. Excluding them did not alter the results of the paper at all.

Second, we incorporated additional time-varying macroeconomic and country-specific control variables to evaluate the independent impact of internationalization on domestic turnover. For instance, we included the inflation rate since inflation may interfere with trading and reduce market turnover (Boyd, Levine, and Smith, 2001). We controlled for economic growth since business-cycle phenomenon may influence market activity. We examined terms of trade changes since shocks may importantly influence equity market transactions. In other specifications, we included the real interest rate, a broad index of financial liberalization developed by Kaminsky and Schmukler (2003), and a time trend. Including these additional macroeconomic controls did not change the results on the impact of internationalization on the turnover of domestic firms.

Third, we controlled for additional firm-specific and industry-specific characteristics. This is important since firm-specific traits may lead high-performing firms to internationalize and poorly performing firms to remain domestic. Thus, we included industry dummy variables and information on firm sales and profits. This did not change the findings. While we are unable to rule out the possibility that some third factor is driving the results, the findings remain robust to many controls.

Fourth, to measure spillover effects in a different way, we estimated equations (3), (4), and (5) including the aggregate domestic turnover of both domestic and international firms, instead of the turnover of only international firms. We confirmed this paper's conclusions.

Fifth, we experimented with different samples. There may be concerns about the entry and exit of firms. Thus, we re-did the analyses using a subsample of firms that exist for the entire period and obtained the same conclusions. Also, 18 out of 55 countries have zero or only one international firm. Thus, we re-did the analyses eliminating these countries and got the same results.

Sixth, we examined whether internationalization has a different impact on domestic firms depending on their size or other characteristics. Thus, we assessed whether the turnover of big firms that do not internationalize falls more or less than smaller firms that do not internationalize. We also examined firm profitability and sales. These interaction terms did not enter significantly.

IV. Conclusions

This paper finds that the internationalization of stock markets is negatively related to the trading activity of domestic firms in emerging markets. In particular, the paper identifies two channels through which internationalization appears to affect negatively trading activity. First, trading migrates to international financial markets, having negative spillover effects on the trading of domestic firms in domestic markets. These spillover results indicate that an individual equity's

trading activity depend importantly on the market's overall activity. Second, there is trade diversion in domestic markets as trading shifts from domestic to international stocks within the local market.

The findings in this paper have opened several avenues for future research. First, the effects of internationalization seem to be different in emerging economies than in European markets (see Halling, Pagano, Randl, and Zechner, 2005). While for emerging economies the market appears to settle overseas, for European countries the most important market seems to be the domestic one. Therefore, it would be very interesting to analyze to what degree the characteristics of the host and home countries (and exchanges) determine these different equilibrium outcomes. It would also be interesting to understand to what extent there are differences within emerging and European countries. Second, a theoretical model that more comprehensively specifies the mechanisms influencing the impact of internationalization on domestic markets would substantively sharpen the interpretation of the empirical results. Third, although this paper finds strong evidence of spillovers, we do not identify the source of these spillovers. To better understand the operation of financial markets, future research might usefully investigate the nature of spillovers. Levine and Schmukler (2006) take a step in this direction by examining spillovers on other liquidity measures. Fourth, it would be interesting to study the net effect of internationalization in emerging economies. Some papers have argued that internationalization has positive effects on the firms that internationalize. This paper has shown that internationalization hurts the trading activity of domestic firms. Furthermore, as mentioned above, research finds that domestic market turnover is important for the cost of capital, firm performance, and economic growth. Thus, if internationalization helps international firms and hurts domestic firms, a critical question emerges: what is the net effect for the domestic economy of firms that internationalize? What is the future for domestic markets and

companies that are unable to internationalize? These questions might represent fruitful areas for future research.

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Table 1
Effects of Internationalization on Domestic Firms

This table reports the regressions of the log of one plus the turnover ratio of domestic firms (T^D) on the share of international firms (IS), the log of one plus the aggregate turnover ratio in international markets (IT^I), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The share of international firms variable is measured as the number of international firms as a percent of the total number of listed firms in the country. The regressions also include country and year dummies, though they are not reported in the table. The sample includes only domestic firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$T_{j,c,t}^D = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Turnover Ratio of Domestic Firms						
$IS_{c,t}$	-1.386 *** [5.185]	-2.977 *** [8.171]	-3.010 *** [7.799]	-2.547 *** [6.785]	-2.929 *** [8.185]	-2.564 *** [6.627]
$IT_{c,t}^I$	0.236 *** [4.369]	0.179 *** [3.113]	0.167 *** [2.858]	0.215 *** [3.637]	0.173 *** [3.019]	0.191 *** [3.198]
Log of GDP per capita			0.204 *** [5.023]			0.161 *** [3.914]
Law and Order				0.045 *** [4.717]		0.035 *** [3.612]
Capital Account Liberalization					-0.009 [0.455]	-0.021 [1.020]
Log of Total Assets		-0.060 *** [9.712]	-0.062 *** [9.818]	-0.062 *** [9.874]	-0.056 *** [9.085]	-0.058 *** [9.283]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	2,400	1,531	1,530	1,509	1,517	1,494
Number of Observations	12,762	7,312	7,298	7,233	7,138	7,045

Table 2
Effects of Internationalization on International Firms

This table reports the regressions of the log of one plus the turnover ratio of international firms (T^I) on the share of international companies (IS), the log of one plus the aggregate turnover ratio of other international firms in international markets, excluding firm j (IT^I), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The share of international firms variable is measured as the number of international firms as a percent of the total number of listed firms in the country. The regressions also include country and year dummies, though they are not reported in the table. The sample includes only international firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$T_{j,c,t}^I = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Turnover Ratio of International Firms						
$IS_{c,t}$	-1.490 *** [5.439]	-2.446 *** [7.314]	-2.493 *** [7.303]	-2.307 *** [6.928]	-2.490 *** [7.497]	-2.393 *** [7.142]
$IT_{j,c,t}^I$	0.184 *** [3.950]	0.189 *** [3.858]	0.196 *** [3.870]	0.198 *** [4.005]	0.192 *** [3.942]	0.213 *** [4.181]
Log of GDP per capita			-0.043 [1.004]			-0.058 [1.342]
Law and Order				0.017 [1.359]		0.021 * [1.671]
Capital Account Liberalization					-0.008 [0.319]	-0.003 [0.118]
Log of Total Assets		-0.021 *** [2.796]	-0.021 *** [2.723]	-0.021 *** [2.834]	-0.021 *** [2.817]	-0.021 *** [2.767]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	587	553	553	552	553	552
Number of Observations	3,614	3,172	3,172	3,163	3,140	3,131

Table 3
Effects of Internationalization on International Firms - Beyond Spillovers

This table reports the regressions of the log of one plus the turnover ratio of international firms (T^I) on the share of international firms (IS), the log of one plus the aggregate turnover ratio of other international firms in international markets, excluding firm j (IT^I), the log of one plus the aggregate turnover ratio of other international firms in the domestic market, excluding firm j (T^I), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The share of international firms variable is measured as the number of international firms as a percent of the total number of listed firms in the country. The regressions also include country and year dummies, though they are not reported in the table. The sample includes only international firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$T_{j,c,t}^I = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \beta \times T_{j,c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Turnover Ratio of International Firms						
$IS_{c,t}$	-1.051 *** [2.970]	-1.268 *** [4.151]	-1.260 *** [4.127]	-1.168 *** [3.856]	-1.324 *** [4.372]	-1.229 *** [4.114]
$IT_{j,c,t}^I$	0.095 [1.512]	0.010 [0.219]	0.009 [0.190]	0.014 [0.301]	0.014 [0.297]	0.017 [0.374]
$T_{j,c,t}^I$	0.233 * [1.905]	0.473 *** [9.565]	0.474 *** [9.675]	0.474 *** [9.566]	0.463 *** [9.225]	0.464 *** [9.343]
Log of GDP per capita			0.006 [0.146]			0.000 [0.011]
Law and Order				0.010 [0.857]		0.010 [0.863]
Capital Account Liberalization					-0.001 [0.053]	0.001 [0.024]
Log of Total Assets		-0.020 *** [2.673]	-0.020 *** [2.663]	-0.020 *** [2.697]	-0.020 *** [2.703]	-0.021 *** [2.708]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	587	553	553	552	553	552
Number of Observations	3,614	3,172	3,172	3,163	3,140	3,131

Table 4
Effects of Internationalization on Migration

This table reports the regressions of the log of one plus the domestic turnover of international firms (T^I) relative to their total turnover, which includes their domestic turnover (T^I) and their turnover in international markets (IT^I), on the share of international firms (IS), the log of one plus the aggregate turnover ratio of other international firms in international markets, excluding firm j (IT^I), the log of one plus the aggregate turnover ratio of other international firms in the domestic market, excluding firm j (T^I), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The share of international firms variable is measured as the number of international firms as a percent of the total number of listed firms in the country. The regressions also include country and year dummies, though they are not reported in the table. The sample includes only international firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$\frac{T_{j,c,t}^I}{T_{j,c,t}^I + IT_{j,c,t}^I} = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{j,c,t}^I + \beta \times T_{j,c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Share of Value Traded Domestically of International Firms						
$IS_{c,t}$	-0.924 *** [6.128]	-0.949 *** [5.500]	-0.981 *** [5.700]	-0.977 *** [5.526]	-0.946 *** [5.460]	-0.998 *** [5.653]
$IT_{j,c,t}^I$	-0.018 [0.640]	-0.023 [0.735]	-0.019 [0.608]	-0.023 [0.742]	-0.022 [0.710]	-0.018 [0.562]
$T_{j,c,t}^I$	0.020 * [1.928]	0.039 *** [3.549]	0.037 *** [3.478]	0.039 *** [3.533]	0.039 *** [3.390]	0.037 *** [3.289]
Log of GDP per capita			-0.025 [1.157]			-0.026 [1.186]
Law and Order				-0.002 [0.575]		-0.001 [0.199]
Capital Account Liberalization					-0.001 [0.089]	0.000 [0.020]
Log of Total Assets		-0.002 [0.728]	-0.002 [0.662]	-0.002 [0.713]	-0.002 [0.715]	-0.002 [0.643]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	572	540	540	539	540	539
Number of Observations	3,515	3,060	3,060	3,056	3,028	3,024

Table 5
Effects of Internationalization on Domestic Firms - Beyond Spillovers

This table reports the regressions of the log of one plus the turnover ratio of domestic firms (T^D) on the share of international firms (IS), the log of one plus the aggregate turnover ratio in international markets (IT^I), the log of one plus the aggregate turnover ratio of international firms in the domestic market (T^I), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The share of international firms variable is measured as the number of international firms as a percent of the total number of listed firms in the country. The regressions also include country and year dummies, though they are not reported in the table. The sample includes only domestic firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$T_{j,c,t}^D = \gamma_1 \times IS_{c,t} + \gamma_2 \times IT_{c,t}^I + \beta \times T_{c,t}^I + \theta' M_{c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Turnover Ratio of Domestic Firms						
$IS_{c,t}$	-0.793 *** [3.062]	-2.083 *** [6.352]	-2.117 *** [6.187]	-1.852 *** [5.438]	-1.849 *** [5.984]	-1.672 *** [5.000]
$IT_{c,t}^I$	0.099 * [1.903]	0.066 [1.178]	0.054 [0.958]	0.092 [1.607]	0.050 [0.899]	0.047 [0.827]
$T_{c,t}^I$	0.325 *** [15.823]	0.297 *** [9.965]	0.297 *** [9.899]	0.281 *** [9.266]	0.300 *** [9.968]	0.292 *** [9.531]
Log of GDP per capita			0.201 *** [5.157]			0.195 *** [4.866]
Law and Order				0.027 *** [2.860]		0.013 [1.337]
Capital Account Liberalization					-0.034 * [1.757]	-0.047 ** [2.315]
Log of Total Assets		-0.061 *** [9.958]	-0.063 *** [10.055]	-0.062 *** [10.025]	-0.057 *** [9.331]	-0.059 *** [9.448]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	2,400	1,531	1,530	1,509	1,517	1,494
Number of Observations	12,762	7,312	7,298	7,233	7,138	7,045

Table 6
Effects of Internationalization on Domestic Firms - Trade Diversion Effects

This table reports the regressions of the log of one plus the turnover ratio for each firm over the total turnover ratio in the domestic market (S) on a dummy for the international period of a firm (I), the log of one plus the turnover ratio in international markets (IT^I), market capitalization ($MCap$), the log of GDP per capita, the index of law and order, the capital account liberalization dummy, and the log of total assets (F). The dummy for the international period of a firm equals one in the year of internationalization and in the following years, and zero otherwise. The regressions also include country and year dummies, though they are not reported in the table. The sample includes domestic and international firms. Absolute values of t-statistics are in brackets. *, **, *** mean significance at ten, five, and one percent, respectively. The estimated equation is the following:

$$S_{j,c,t} = \phi_1 \times I_{j,c,t} + \phi_2 \times IT_{j,c,t}^I + \theta^1 M_{c,t} + \kappa \times MCap_{j,c,t} + \lambda_1 \times F_{j,c,t} + \delta_1 \times n_c + \delta_2 \times \tau_t + \varepsilon_{j,c,t} .$$

Dependent Variable:						
Log of One Plus the Share of Firm j Value Traded						
$I_{j,c,t}$	0.119 *** [6.061]	0.104 *** [5.197]	0.104 *** [5.230]	0.103 *** [5.157]	0.105 *** [5.327]	0.104 *** [5.293]
$IT_{j,c,t}^I$	0.170 ** [2.321]	0.120 [1.561]	0.129 * [1.701]	0.123 [1.591]	0.116 [1.510]	0.126 [1.667]*
$MCap_{j,c,t}$	-0.108 *** [22.112]	-0.123 *** [17.683]	-0.124 *** [17.788]	-0.123 *** [17.515]	-0.122 *** [17.397]	-0.123 *** [17.356]
Log of GDP per capita			0.205 *** [5.295]			0.221 *** [5.592]
Law and Order				0.007 [0.728]		-0.006 [0.626]
Capital Account Liberalization					-0.006 [0.226]	-0.020 [0.786]
Log of Total Assets		0.018 ** [2.522]	0.017 ** [2.408]	0.017 ** [2.378]	0.019 *** [2.632]	0.017 ** [2.415]
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Firms	3,070	2,148	2,147	2,129	2,084	2,064
Number of Observations	16,574	10,698	10,684	10,633	10,407	10,328
R-squared	0.733	0.751	0.752	0.751	0.750	0.751

Appendix Table 1
Basic Statistics and Means

This table reports summary statistics by country. It displays the total number of firms, the number of international firms, the number of domestic firms, the sample coverage, and the sample average of some of the variables used in the regressions. The turnover variables reported (turnover of domestic firms, turnover of international firms in the domestic market, and turnover of international firms in international markets) are the logarithm of one plus the variable. International companies are the ones that issue a depositary receipt, cross-list, or raise capital in a foreign stock exchange at any time in the sample.

	Country	Number of Firms	Number of International Firms	Number of Domestic Firms	Sample Period	Turnover (Domestic Firms)	Turnover in the Domestic Market (International Firms)	Turnover in International Markets (International Firms)	Share of International Firms	Market Capitalization (U.S. dollars, Million)
1	Argentina	19	6	13	1989 - 2000	0.349	0.136	0.240	0.078	821.8
2	Bahrain	15	1	14	1999 - 2000	0.097	0.053	0.000	0.000	344.6
3	Bangladesh	66	1	65	1996 - 2000	0.281	0.376	0.000	0.005	23.8
4	Botswana	9	0	9	1996 - 2000	0.070	0.000	0.000	0.000	79.8
5	Brazil	103	50	53	1989 - 2000	0.266	0.305	0.239	0.046	1400.7
6	Bulgaria	25	1	24	1996 - 2000	0.026	0.031	0.000	0.001	17.4
7	Chile	57	21	36	1989 - 2000	0.074	0.122	0.204	0.052	839.8
8	China	251	51	200	1992 - 2000	0.915	0.737	0.076	0.054	623.3
9	Colombia	36	8	28	1989 - 2000	0.072	0.117	0.044	0.032	298.8
10	Cote d'Ivoire	14	0	14	1996 - 2000	0.025	0.000	0.000	0.000	67.4
11	Croatia	10	3	7	1997 - 2000	0.044	0.037	0.000	0.049	285.7
12	Czech Republic	49	4	45	1994 - 2000	0.095	0.277	0.000	0.005	228.1
13	Ecuador	13	2	11	1996 - 2000	0.061	0.165	0.000	0.055	88.6
14	Egypt	83	8	75	1996 - 2000	0.261	0.303	0.000	0.006	182.4
15	Estonia	10	1	9	1997 - 2000	0.336	0.310	0.000	0.042	81.6
16	Ghana	11	1	10	1996 - 2000	0.086	0.001	0.389	0.047	116.7
17	Greece	57	9	48	1989 - 2000	0.435	0.316	0.008	0.016	685.0
18	Hungary	20	13	7	1992 - 2000	0.321	0.457	0.021	0.228	456.6
19	India	183	51	132	1989 - 2000	0.225	0.374	0.043	0.006	508.6
20	Indonesia	127	8	119	1989 - 2000	0.401	0.361	0.124	0.016	371.7
21	Israel	52	18	34	1997 - 2000	0.227	0.340	0.444	0.025	771.1
22	Jamaica	24	4	20	1996 - 2000	0.041	0.060	0.000	0.086	77.6
23	Jordan	64	3	61	1989 - 2000	0.282	0.186	0.000	0.003	82.3
24	Kenya	19	0	19	1996 - 2000	0.050	0.000	0.000	0.000	79.8
25	Latvia	16	2	14	1997 - 2000	0.279	0.301	0.000	0.027	16.0
26	Lebanon	5	2	3	1999 - 2000	0.104	0.073	0.000	0.000	346.8
27	Lithuania	43	4	39	1996 - 2000	0.126	0.317	0.000	0.041	30.5
28	Malaysia	196	12	184	1989 - 2000	0.520	0.249	0.000	0.014	783.6

Appendix Table 1 (Continued)

Basic Statistics and Means

This table reports summary statistics by country. It displays the total number of firms, the number of international firms, the number of domestic firms, the sample coverage, and the sample average of some of the variables used in the regressions. The turnover variables reported (turnover of domestic firms, turnover of international firms in the domestic market, and turnover of international firms in international markets) are the logarithm of one plus the variable. International companies are the ones that issue a depositary receipt, cross-list, or raise capital in a foreign stock exchange at any time in the sample.

	Country	Number of Firms	Number of International Firms	Number of Domestic Firms	Sample Period	Turnover (Domestic Firms)	Turnover in the Domestic Market (International Firms)	Turnover in International Markets (International Firms)	Share of International Firms	Market Capitalization (U.S. dollars, Million)
29	Mauritius	17	0	17	1996 - 2000	0.037	0.000	0.000	0.000	92.5
30	Mexico	98	59	39	1989 - 2000	0.234	0.346	0.401	0.207	1438.3
31	Morocco	21	1	20	1996 - 2000	0.089	0.165	0.000	0.019	522.7
32	Namibia	7	0	7	1999 - 2000	0.093	0.000	0.000	0.000	38.2
33	Nigeria	41	1	40	1989 - 2000	0.021	0.015	0.000	0.001	61.8
34	Oman	34	0	34	1999 - 2000	0.145	0.000	0.000	0.000	85.9
35	Pakistan	124	4	120	1989 - 2000	0.203	1.150	0.000	0.003	84.4
36	Peru	42	8	34	1992 - 2000	0.533	0.258	0.223	0.020	235.3
37	Philippines	77	14	63	1989 - 2000	0.405	0.250	0.069	0.048	622.7
38	Poland	45	17	28	1992 - 2000	0.485	0.498	0.000	0.049	379.3
39	Portugal	41	8	33	1989 - 1999	0.208	0.423	0.065	0.018	543.0
40	Romania	52	1	51	1997 - 2000	0.227	0.071	0.000	0.000	18.4
41	Russia	42	19	23	1996 - 2000	0.177	0.200	0.021	0.064	1463.6
42	Saudi Arabia	22	0	22	1997 - 2000	0.308	0.000	0.000	0.000	2047.4
43	Slovak Republic	17	2	15	1996 - 2000	0.331	0.143	0.000	0.002	53.4
44	Slovenia	20	2	18	1996 - 2000	0.347	0.299	0.000	0.058	108.5
45	South Africa	93	56	37	1992 - 2000	0.149	0.182	0.033	0.059	1812.6
46	South Korea	228	33	195	1989 - 2000	1.168	0.870	0.052	0.019	811.8
47	Sri Lanka	66	1	65	1992 - 2000	0.125	0.180	0.000	0.004	27.9
48	Taiwan, Province of China	142	30	112	1989 - 2000	1.500	1.203	0.028	0.031	1617.5
49	Thailand	106	14	92	1989 - 2000	0.573	0.427	0.000	0.016	666.8
50	Trinidad and Tobago	12	1	11	1996 - 2000	0.045	0.069	0.000	0.040	215.0
51	Tunisia	18	1	17	1996 - 2000	0.086	0.122	0.000	0.015	147.5
52	Turkey	63	14	49	1989 - 2000	0.879	0.737	0.004	0.028	594.1
53	Ukraine	19	5	14	1997 - 2000	0.069	0.120	0.000	0.028	96.9
54	Venezuela	23	13	10	1989 - 2000	0.126	0.233	0.170	0.083	335.6
55	Zimbabwe	34	4	30	1989 - 2000	0.091	0.179	0.000	0.047	59.9
	Total	3,081	592	2,489		0.506	0.411	0.068	0.034	671.7

Appendix Table 2

Series Description and Data Sources

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

Series	Description	Source
Variables related to the internationalization of stock markets	The data come from Bank of New York (1989-2000) and Euromoney (1980-2000). This information is used to classify firms as domestic or international companies. International companies are the ones that issue a depositary receipt, cross-list, or raise capital in a foreign stock exchange at any time in the sample. Different variables are constructed using these data. See text for details.	Bank of New York and Euromoney
Domestic market capitalization (current U.S. dollars)	Market capitalization in domestic stock markets.	Standard & Poor's (former International Finance Corporation) Emerging Markets Database
Domestic value traded (current U.S. dollars)	Value traded in domestic stock markets.	Standard & Poor's (former International Finance Corporation) Emerging Markets Database
Value traded in foreign markets (current U.S. dollars)	Value traded in depositary receipts. Series are computed on a firm-level basis by adding the different depositary receipts that belong to each company on a yearly basis.	Bank of New York
GDP per capita at market prices (current U.S. dollars)	Gross domestic product (GDP) divided by mid-year population. The GDP at purchaser prices data is converted from domestic currencies using yearly official exchange rates. For the cases in which the official exchange rate is different from the market rate, the latter is used.	World Bank: World Development Indicators
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 comprising zero to three points. The law sub-component is an assessment of the strength and impartiality of the legal system, while the order sub-component is an assessment of popular observance of the law. Thus, a country can have a high rating in terms of its judicial system, for example 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
Capital account liberalization	Dummy that equals one on and after the year of capital account liberalization, and zero elsewhere.	International Monetary Fund: Annual Report on Exchange Arrangements and Exchange Restrictions
Total assets	Total assets as reported in Worldscope for each firm-year, in million of U.S. dollars.	Worldscope