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The U.S. left behind? Financial globalization and the rise of IPOs outside the U.S. ☆

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ABSTRACT

From 1990 to 2011, the share of world IPO activity by non-U.S. firms increased because of financial globalization and because of a decrease in U.S. IPO activity. Financial globalization reduces the impact of national institutions on domestic IPO activity and enables more non-U.S. firms from countries with weak institutions to go public with a global IPO. U.S. IPO activity does not benefit from financial globalization. Compared to other countries, the rate of small-firm IPO activity in the U.S. is abnormally low in the 2000s. This abnormally low rate cannot be explained by the regulatory changes of the early 2000s.

1. Introduction

It is widely believed that a vibrant market for initial public offerings (IPOs) is an asset of the U.S. Black and Gilson (1998), and many others, argue that this market plays a critical role in facilitating entrepreneurship and venture capital in the U.S. economy. This view permeates corporate finance textbooks. For example, Megginson and Smart (2009) write: "Given its role in providing capital market access for entrepreneurial growth companies, the U.S. initial public offering market is widely considered a vital economic and financial asset." The law and finance literature shows that IPO activity depends on country-level laws and governance institutions. For instance, it finds that IPO activity is higher in common law countries compared to countries with other legal origins. From this perspective, the U.S. has a history of vibrant IPO activity, at least in part, because of its strong laws and governance institutions.

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However, financial globalization makes it possible for firms to take advantage of the institutions of other countries, so that the institutions of a firm's home country could become less important in its decision-making (e.g., Coffee, 1999; Stulz, 1999, 2009; Doidge, Karolyi, and Stulz, 2007).

There has been considerable concern in the U.S. about low IPO activity in recent years.[1] We use a comprehensive sample of 33,061 IPOs from 88 countries constituting $3.06 trillion (constant 2007 U.S. dollars) of capital raised over 1990–2011 to show that this low IPO activity is anomalous. From the 1990s to the 2000s, capital raised through IPOs outside of the U.S. increased by 65%, while capital raised within the U.S. fell by 8%. During that period, financial globalization, defined as the ease with which capital can move around the world to find its most valued use, increased sharply as countries removed barriers to capital flows and new tools were developed to facilitate cross-border investment. We find that financial globalization has been an important driver of IPO activity outside the U.S. and that it is associated with a reduction in the importance of the quality of a country's institutions as a determinant of its IPO activity.

Because U.S. IPO activity has not kept up with the rest of the world, the U.S. share of worldwide IPO activity has decreased. In the 1990s, the U.S. share of the number of IPOs worldwide averaged 31% compared to 10% in the 2000s. While the U.S. share of IPO counts fell by 68%, the U.S. share of proceeds fell from 31% to 21%, or by a third. A decrease in the U.S. share of world IPOs could arise because the economic importance of the U.S. decreased, but this is not the case. In the 1990s, the U.S. accounted for 27% of world Gross Domestic Product (GDP). Since 2000, the U.S. share of worldwide GDP has averaged 29%. We show that an important part of the decrease in the U.S. share is due to the fact that while IPO activity outside the U.S. appears to have benefitted from the increase in financial globalization, U.S. IPO activity did not.

To a large extent, IPO activity outside the U.S. is fueled by the emergence of global IPOs, which are IPOs with both a domestic and foreign tranche ("international" IPOs) or IPOs with a foreign tranche but no domestic tranche ("foreign" IPOs). In the 1990s, proceeds raised globally (from foreign tranches) averaged 26% of total proceeds, while in the 2000s they averaged 39%. During the last five years of the sample period, global IPO proceeds averaged 49% of total proceeds, or almost double the fraction in the 1990s. Almost all of the proceeds raised globally in the 2000s were raised by non-U.S. firms. Caglio, Hanley, and Marietta-Westberg (2012) also find that global IPOs account for a significant fraction of total IPO proceeds. This growth in importance of global IPOs could not have taken place without the increased integration of financial markets around the world.

The law and finance literature predicts theoretically that differences in countries' laws, governance, disclosure, and enforcement standards (hereafter "institutions") that protect minority shareholders can explain differences in IPO activity across countries (e.g., Shleifer and Wolfenzon, 2002, hereafter SW). For the years that precede much of the large increase in financial globalization that took place since the 1990s, there is much evidence consistent with this prediction (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997, 1998, hereafter LLSV; La Porta, Lopez-de-Silanes, and Shleifer, 2006, hereafter LLS; and Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2008, hereafter DLLS). This literature also predicts that IPO activity in countries other than the U.S. should increase relative to that in the U.S. if their institutions improve relative to those of the U.S. or if a country's institutions become less important determinants of IPO activity. While institutions typically change slowly, an increase in financial globalization can affect the importance of home country institutions quickly. We focus on the latter effect.

SW provide the archetypal model of how a country's laws and governance affect the benefits and costs of going public for the owners of firms and hence affect the likelihood that a firm will go public in a given country. In their model, the problem for public firms is that the controlling shareholder can extract private benefits at the expense of minority shareholders. Since minority shareholders buy shares at fair value, any expected private benefits consumption reduces IPO proceeds. In equilibrium, the amount of private benefits consumption and the associated deadweight costs are inversely related to the quality of institutions. Private benefits are lower in countries with good institutions so that, in these countries, the equity of firms is worth more and more firms gain from going public. We test this prediction using several different country-level proxies for institutions. Countries with better institutions have more domestic IPO activity, measured as either the annual number of domestic IPOs scaled by the lagged number of domestic listed firms or as the annual proceeds raised in domestic IPOs scaled by lagged GDP. These results hold after controlling for various measures of economic and financial development as well as other determinants of IPO activity.

The global free flow of capital allows firms to raise funds publicly outside of their country of domicile. SW, Doidge, Karolyi, and Stulz (hereafter DKS, 2007), and Stulz (2005, 2009) address the impact of financial globalization on IPO activity. They suggest that home country institutions may have opposite effects on domestic compared to global IPOs. That is, global IPOs can be used to overcome the adverse effects of poor home country institutions and firms from countries with poor institutions are more likely to use a global IPO. In the models of DKS and Stulz (2009), financial market globalization allows firms to borrow the institutions of foreign countries. For example, global IPOs often involve a foreign listing, so that a firm using a global IPO becomes subject to laws and regulations, as well as monitoring, outside its home country. The literature on foreign listings provides evidence of this monitoring and

[1] These concerns led to a new law that President Obama signed into law on April 5, 2012 with bipartisan Congressional support. H.R. 3606, the Jumpstart Our Business Startups (JOBS) Act, was designed to stoke job creation and economic growth by improving access to the public capital markets for emerging growth companies. The act defines emerging growth companies as issuers with total annual gross revenues of less than $1 billion (to be adjusted for inflation) during its most recently completed fiscal year.

demonstrates that this benefit is important when firms list in the U.S. (see Karolyi, 2012).

Firms which issue global IPOs can also take advantage of foreign institutions and can involve foreign monitoring even when they are not associated with a foreign listing. Firms that raise capital globally are exposed to a wide variety of monitoring mechanisms, ranging from the use of more reputable investment banks, accounting firms, and law firms, to monitoring by financial analysts, by institutional investors, and by more reputable directors. Obviously, these monitoring mechanisms are not all equally effective for every type of firm. For instance, monitoring cannot be successful if monitors cannot affect firms' actions or obtain redress from insiders (Stulz, 2009). Monitoring will generally be easier and more effective when firms have activities outside of their own country or have valuable growth opportunities that would be lost if one possible outcome of monitoring is that they can no longer raise capital globally.

Firms from countries with weaker institutions should benefit more from borrowing stronger institutions of foreign countries and we expect that they are more likely to use a global IPO. All else equal, we also expect that small firms are less likely to use a global IPO because of the importance of economies of scale in accessing global markets. For instance, if a non-U.S. firm has to make regulatory filings in the U.S. because it intends to sell IPO shares in the U.S., the cost of such a filing has a large fixed cost component. Lawyers, auditors, underwriters, and investor relations firms need to be secured. To investigate these predictions, we estimate logistic regression models of the firm's choice between a domestic IPO and a global IPO. In these regressions, we exclude U.S. firms because the U.S. is an important destination market for global IPOs. We allow a firm's choice to depend on its size, the quality of home country institutions, and other country characteristics. We find strong support for both predictions. Firms from countries with poor institutions are more likely to use a global IPO and small firms are less likely to use a global IPO. These results are related to Caglio, Hanley, and Marietta-Westberg (2012). They show that the characteristics of firms that go public abroad are different from those that choose a domestic IPO and that such firms originate from countries with lower bond and stock market development and lower disclosure standards. However, as we discuss next, our main focus is on the role of financial globalization, how it affects the importance of institutions, and how firm size plays a role in enabling firms to take advantage of the benefits of financial globalization.

Home country institutions should be less important in a more global world because firms can benefit from the institutions and resources of other countries when used in their governance activities, even if they do not go public through a global IPO (Stulz, 1999). For instance, because of greater financial globalization, firms that go public in their own country can now use foreign auditors, lawyers, and investment bankers. The IPO literature emphasizes the importance of certification of the issuing firm (Ritter and Welch, 2002) and the use of foreign advisers and monitors, who can help certify the quality of the issuing firm in a more credible way than local advisers and monitors. Financial globalization also makes it easier for overseas investors to invest in IPOs from a given country. When an IPO is global, it is specifically structured so that it can be more easily accessed by overseas investors. However, as barriers to international investment become less important, foreign investors also have easier access to domestic IPOs. Because foreign investors are typically institutional investors, they can be more active monitors of firms. In particular, they can push for better firm-level governance, as shown in Aggarwal, Erel, Ferreira, and Matos (2011), and they can demand more shareholder-friendly behavior from management to prevent such investors from walking away.

DKS predict that the role of home country institutions for domestic IPO activity, conditional on the level of financial and economic development, is lower when global markets are more accessible. To test this prediction, we construct a measure of financial globalization from the updated and extended data set compiled by Lane and Milesi-Ferretti (LMF, 2007). Each year, we sum the U.S. dollar-denominated value of external assets and liabilities across countries and divide the sum by world GDP (also in U.S. dollars). The domestic IPO rate is strongly negatively related to financial globalization. Perhaps more importantly, the impact of national institutions on the domestic IPO rate falls as financial globalization increases. For instance, using the anti-self-dealing index of DLLS as a measure of the quality of institutions, we find that a one standard deviation higher index score is associated with a 1.44% higher domestic IPO rate when the financial globalization measure is lower (such as during the 1990s when the ratio of external assets and liabilities to world GDP was 139%). However, a one standard-deviation higher index score is associated with only a 0.58% higher domestic IPO rate when the financial globalization measure is higher (such as during the 2000s when the ratio of external assets and liabilities to world GDP exceeded 289%). We also find that firms are more likely to choose a global IPO as financial globalization increases and that firms are less likely to choose a global IPO as the quality of national institutions increases.

Both small and large firms are more likely to choose a global IPO with greater financial globalization, though the effect is much more pronounced for small firms. Both small and large non-U.S. firms going public benefit from the increase in financial globalization while U.S. firms do not, which helps explain why the U.S. share of world IPOs has become much lower. The fall in the U.S. share of worldwide small-firm IPOs is the most notable. That share started to decline in the late 1990s and has become trivially small, averaging just 5% per year in the 2000s. Gao, Ritter, and Zhu (2012) argue that the low rate of small-firm IPO activity in the U.S. is due to the fact that it has become more efficient for small firms to be acquired than to grow on their own with funds obtained from public offerings. They refer to this as the "economies of scope" hypothesis. Our results show, however, that low IPO activity by small firms in the U.S. is not a worldwide phenomenon. In particular, we find that small-firm IPO activity by non-U.S. firms grew relative to that of the U.S. with financial globalization.

Using our model, we are better able to understand which U.S.-specific factors led to abnormally low small-firm IPO

activity in the U.S. Explanations that point to U.S. factors emphasize either the regulatory changes of the early 2000s, namely, Regulation Fair Disclosure in 2000 and the adoption of the Sarbanes-Oxley Act (SOX) in 2002, or changes in the ecosystem of small public firms in the 1990s that made it more difficult for small firms to succeed as public firms [see Ritter (forthcoming) for a review of these explanations]. Our results make it possible to reject the hypothesis that the regulatory changes of the early 2000s caused the decrease in small-firm IPO activity because it became abnormally low before these changes took place.

The literature on time-series variation in IPO activity focuses on changes in growth opportunities and market conditions. Ritter's (2003, p. 293) survey points out that swings in the volume of IPOs are of considerable interest and that the volume seems to be "hypersensitive to changes in market conditions." Lowry (2003) addresses why IPO volume fluctuates so much and concludes that changes in aggregate capital demands of private firms and in investor optimism are the primary determinants. Pagano, Panetta, and Zingales (1998) find that for a sample of Italian IPOs the predominant reason firms go public is to rebalance their capital structure and to exploit mispricing, rather than to raise capital for financing investments. Loughran and Ritter (1995) also find support for the market-timing explanation for U.S. IPOs, while Henderson, Jegadeesh, and Weisbach (2006) find similar results internationally. To capture changing market conditions, we control for the country-level Tobin's q ratio as well as for country-level GDP growth. Though GDP growth is an important determinant of the rate at which firms go public in a country, it does not affect a firm's decision to use a global IPO. Instead, the decision to use a global IPO is affected by financial development, in that firms are more likely to have a global IPO in countries with weaker financial development.

The paper proceeds as follows. In Section 2 we explain the construction of our IPO sample and describe its characteristics. Section 3 documents the rise of IPO activity abroad and the decline of IPO activity in the U.S. In Section 4 we show how financial globalization is related to domestic IPO activity and, in Section 5, we test our hypotheses about the determinants of global IPO activity across countries and over time. In Section 6, we show how the increase in financial globalization has affected small and large firms differentially. We investigate the evolution of total IPO activity across countries and how that evolution is related to financial globalization in Section 7. We show in Section 8 that the regulatory changes of the early 2000s cannot explain the abnormally low rate of small-firm IPO activity in the U.S. during the 2000s. We discuss the robustness of our results in Section 9 and conclude in Section 10.

2. The IPO sample and country-level data

2.1. IPO sample

We obtain IPO data from the Securities Data Company's (SDC) Global New Issues database. For each IPO that we use, this database provides information on the issuer, the issue date, total proceeds, the number and type of shares offered, the offer price, whether the issue is domestic only or contains a foreign tranche, and whether or not a tranche is offered to public or private investors. We begin by downloading all transactions in SDC where the "original IPO" flag is set to "yes." Because SDC has limited coverage for non-U.S. IPOs prior to 1990, our sample begins in January 1990. The sample ends in December 2011. The initial count is 45,167 observations. We eliminate transactions with a single domestic tranche that SDC flags as a private placement (76 observations). There are 684 cases for which there is more than one transaction reported in SDC for the same firm within a narrow window of time. Many of these are global IPOs for which the domestic and foreign tranches have different issue dates, usually within a few days of each other. We drop 256 observations with a gap of 30 days or more between issue dates. Following Kim and Weisbach (2008), we remove 51 transactions that do not contain any information on proceeds raised. The data for some IPOs are recorded over multiple lines in SDC, even if there is only one tranche in the offering. We consolidate these issues into one line of record and drop 1,671 observations. Global IPOs, which include foreign IPOs (those with a foreign tranche but no domestic tranche) and international IPOs (those with both domestic and foreign tranches) are often recorded over multiple lines in SDC.[2] We consolidate that information into one line and drop the 4,843 duplicate records. We also drop 116 transactions that do not have Standard Industrial Classification (SIC) codes, leaving us with 38,154 observations, each of which represents a unique IPO.

To construct our final sample, we exclude an additional 5,093 IPOs. We drop 4,908 IPOs by Real Estate Investment Trusts (REITs) and investment funds (SIC codes 6722, 6726, 6798, and 6799), 20 transactions that SDC classified as IPOs but were actually seasoned equity offerings, 103 IPOs where the country of origin has no data (more details below, but they include tax havens like the British Virgin Islands, Guernsey, or the Cayman Islands), and 62 IPOs from 23 countries for which there were no domestic IPOs (only global IPOs) during the 22-year sample period.[3] The final sample contains 33,061 IPOs from 88 different countries of which 26,670 are purely domestic IPOs and 6,391 are global IPOs.

While we hope that our screening process eliminates mistakes in the SDC database, it cannot add IPOs that were missed by SDC. An alternative source for IPO data is Dealogic. We compare our data to an alternative sample of IPOs collected by Professor Jay Ritter, some of which is

[2] IPOs are assigned to a firm's country of origin. For example, an Israeli firm that goes public with a domestic tranche in Israel is classified as an Israeli domestic IPO. If that firm goes public with a foreign tranche in the U.S., it is classified as an Israeli foreign IPO. If that firm goes public with a foreign tranche in the U.S. and a domestic tranche in Israel at the same time, it is classified as an Israeli international IPO. For U.S. IPOs, when there is a Canadian tranche, SDC often combines it with the U.S. tranche and we would classify these IPOs as domestic.

[3] Countries with no domestic IPOs include: Angola, Barbados, Cambodia, Dominican Republic, Faroe Islands, Georgia, Ghana, Iceland, Kazakhstan, Lebanon, Macau, Malta, Netherlands Antilles, Slovenia, Ukraine, and Uruguay. These countries do not have data on country market conditions and institutions and would not be included in the regressions even if we did not explicitly drop them.

from Dealogic.[4] This sample focuses on the total number of IPOs and does not distinguish between domestic and global IPOs. The Ritter sample covers 46 countries and includes 23,896 IPOs over 1990–2007 (some countries also have data after 2007). Our sample includes 88 countries and 29,233 IPOs over this period. When we restrict our sample to the 46 countries that overlap with those in the Ritter sample, we have 27,799 IPOs, which exceeds the Ritter sample count by 3,903 IPOs. Such a difference is not surprising as the Ritter sample excludes some types of IPOs we do not, such as banks and other financial institutions, unit offerings, and penny stocks. The annual counts are usually quite close though the Ritter sample has fewer IPOs than the SDC sample in all years but three. For most country-years, the differences between the two samples are small and vary in sign, but there are some country-years for which the differences are large. We have a much larger number of IPOs for Canada and the U.S. than in the Ritter sample in most years, which is due to restrictions Ritter imposes on eligible IPOs. We also have more Chinese IPOs in recent years. However, the Ritter sample has a much higher number of IPOs for Turkey and the U.K. in the 1990s than we do.

A second alternative data source is Bloomberg, which is used in Caglio, Hanley, and Marietta-Westberg (2012), another study of global IPOs.[5] Their sample includes 17,808 IPOs from 90 countries over the period 1995 to 2007. The patterns in year-to-year changes are similar to those in SDC, although the counts in SDC are substantially higher until 2000, at which time they become quite close to the Bloomberg counts through 2007. We also conduct a more systematic comparison of the Bloomberg data to the SDC data from the home-market exchanges for four randomly chosen countries (Brazil, Canada, Germany, and Malaysia) from the early 1980s through 2007. In each case, we obtain information on domestic and global IPOs for counts since these exchanges do not report proceeds. For Germany from 1997 to the present, the SDC counts are almost identical to those reported by Deutsche Börse on its Web site. Those for Bloomberg are higher (about a 50% discrepancy, on average); that source reports more than double the count in 2005–2006 relative to the Deutsche Börse and SDC.[6] For Malaysia, the IPO counts in Bloomberg are very similar to those from the Bursa Malaysia website and SDC (less than a 5% discrepancy, on average). For Canada, the Bloomberg counts are 40% lower than for SDC.[7]

2.2. Country-level and world-level data

In our regressions, the dependent variable is a measure of the rate of IPO activity and the explanatory variables are country-level variables as well as some world-level variables. For each country and each year, we compute the number of IPOs ("IPO counts") as well as the total proceeds raised in IPOs ("IPO proceeds"). To compute IPO counts and proceeds, we distinguish between domestic IPOs and global IPOs, which include both foreign IPOs and international IPOs. To benchmark IPO activity across countries that differ in size, we scale the IPO counts by the lagged number of publicly listed domestic companies in the country of domicile and the IPO proceeds by lagged home country GDP. These data are obtained from the World Bank's World Development Indicators (WDI) database. Listed domestic companies include domestically incorporated companies listed on the country's stock exchanges at the end of the year and do not include investment companies, mutual funds, REITs, or other collective investment vehicles. GDP is reported in U.S. dollars converted from domestic currencies using the end-of-year official exchange rate for that country. In addition to our analysis at the country-level, we also estimate logistic regressions at the IPO-level in which the dependent variable is an indicator variable that equals one if a firm goes public with a global IPO as opposed to a domestic IPO.

An important set of data in our work is country-specific institution variables related to the quality of investor legal protections and securities laws related to disclosure requirements and enforcement standards. There are a large number of institution variables that could be used. In our main tests, we focus on a set of representative variables and discuss additional results in the robustness section.

From LLSV, it is well known that common law countries have better institutions. We, therefore, use the common law dummy introduced by LLSV and extended in DLLS. It equals one if the origin of commercial law in a country is English common law, and zero otherwise ("Common law"). It is available for all countries in our sample and has the advantage that it is exogenous to the outcomes we observe. A popular index of legal protections for minority investors is the anti-director rights index of LLSV and updated and revised by DLLS. This index has been criticized for a variety of reasons (see, for example, Coffee, 2001 and Spamann, 2010). DLLS argue that their index of self-dealing is clearer conceptually and pertains more directly to the pervasive problem of corporate self-dealing, or "tunneling." Therefore, we use their index of anti-self-dealing ("Anti-self-dealing")

[4] We thank Jay Ritter for making this sample of IPO counts available to us. In addition to Dealogic, Ritter also relies on academic sources, as described in the updates of his report, entitled "Initial Public Offerings: International Insights," on his Web site.

[5] Their definition of global IPOs is different from ours. They separate IPOs into domestic, foreign, and global IPOs. In their case, global IPOs must list on an exchange outside of their home country to be counted as such. If the IPO includes a foreign tranche and if the firm's shares are not listed on an overseas exchange, they count it as a domestic IPO. In their sample, 94% of the IPOs are classified as domestic. In contrast, with our classification, 81% of IPOs are classified as domestic. Our approach is motivated by the view, explained in the introduction, that IPOs that make use of global markets are subject to qualitatively different monitoring than IPOs that use only domestic markets.

[6] Each of the 81 German IPOs listed in Bloomberg in 2005 was manually checked, and several firms (e.g., Bertelsmann, IC Immobilien, Marenave Schiffahrts, and Qsil) were not on the Deutsche Börse Web site. These firms had announced plans to do an IPO, but subsequently announced that they would defer the IPO due to restructuring or other reasons. Bloomberg appears to rely on corporate news releases and prospectuses.

[7] We also investigated data provided by the World Federation of Exchanges (WFE). WFE data report changes in listing counts, but unfortunately include firms that move from one exchange to another within a given country, as well as investment trusts and other non-corporate listings. We concluded that this source is not useful for our study.

to address the ways in which the law deals with corporate self-dealing. It is assembled by means of a 2003 survey of Lex Mundi law firms in 72 countries. Survey components include those related to ex ante private control of self-dealing, such as disclosures that counterparties in a transaction must make before approval is granted by disinterested shareholders, and those involving ex post disclosures of independent reviews of transactions after completion toward possible rescission or follow-on suits.

DLLS also conclude that the measures of shareholder protection from securities laws constructed in LLS work well in terms of predicting stock market outcomes and are particularly appropriate for studies of protections for investors buying securities. LLS devise measures based on a survey of attorneys in 49 countries in 2000. We use two measures from that study. We use a disclosure requirements index ("Disclosure") that includes components related to requirements for prospectuses, information on compensation of directors and key officers, the issuer's ownership structure, related-party transactions with directors, officers, or large block-holders, and the presence of contracts outside the ordinary course of business. We also use a liability standards index ("Liability standards") that comprises measures of four liability standards in cases against issuers and directors, distributors, and accountants. Finally, we include a measure of the rule of law ("Rule of law") from the World Bank's World Governance Indicators database (see Kaufmann, Kraay, and Mastruzzi, 2010). In contrast to the LLSV and DLLS variables, this variable is measured every year. It captures perceptions of the extent to which agents have confidence in, and abide by, rules related to contract enforcement, property rights, the police and the courts, as well as likelihood of crime and violence. It is based on a survey of public- and private-sector experts and is available for over 200 countries since 1996, including annually from 2002.

For our analysis, we require a measure of the extent of financial globalization. The literature uses a number of measures for *de jure* openness. While these measures exhibit cross-sectional variation, they generally have only limited time-series variation during our sample period. Moreover, they do not capture the extent to which financial globalization is actually taking place (*de facto* openness), which is central to our analysis. If residents from one country can invest freely in another country, they may or may not do so. If they do not do so, it is not clear why financial globalization should lead to more global IPOs since there would be no appetite for IPOs by foreign companies. A proper measure for our purpose should then focus on the extent of gross external claims, including assets and liabilities.[8] Kose, Prasad, Rogoff, and Wei (2009) discuss the pros and cons of various measures and conclude that the most appropriate measure of financial globalization is the one constructed by LMF. We use data from their updated and extended data set that includes annual measures of the sum of a country's external assets and liabilities.[9]

Each year, we sum across each country's external assets and liabilities and divide by world GDP to compute an annual measure of world financial globalization ("World financial globalization"). We do not use a country-level measure for two reasons. First, a country-level measure, even if it is lagged, will likely be higher for countries that recently had global IPOs, thus creating a potential mechanical relation with global IPO activity. There is little risk of such a mechanical relation with the world measure. Second, the world measure captures the extent to which capital markets are interconnected, which makes possible global IPO activity from any country. This measure starts at 118% of world GDP in 1990. It increases slowly until 1997 when it equals 151%. From 1997 to 2000, it increases to 206%, after which it is relatively stable for a few years. It then increases sharply and reaches 376% of GDP in 2008. In 2011, the last year of the sample period, it is 366%.

In our regressions, we also include measures of development. To measure the level of economic development in a country, we use the log of GDP per capita ("Log(GDP per capita)"). This variable is obtained from the WDI database. For measures of financial market development, we use the 2012 update of the Financial Development and Structure database, originally used in Beck, Demirgüç-Kunt, and Levine (2000). We collect data for the stock market turnover ratio ("Market turnover," the ratio of the value of total shares traded to average real market capitalization) and stock market capitalization as a percentage of GDP ("Market cap/GDP," the ratio of the market capitalization of listed shares to GDP).

To control for local market conditions as a factor in the going-public decision, we include a measure of economic growth ("GDP growth") and a country-level measure of Tobin's q. At the firm level, q is computed annually from data obtained from Thomson Reuter's Worldscope database and is defined as the ratio of total assets less the book value of equity plus the market value of equity to the book value of total assets. All variables are in local currency. Using the Fama-French 17-industry classification scheme, we compute the median q and relative market value for each industry annually. The country-level measure of q ("Country q") is the market value-weighted average of the median industry qs. This measure is constructed analogously to the local growth opportunities ("LGO") measure based on price-to-earnings ratios used in Bekaert, Harvey, Lundblad, and Siegel, 2007 (hereafter BHLS, 2007). When we examine global IPOs, we also include a world-level measure of q ("World q"). For all firms in an industry around the world, we compute the median q each year. To compute the world q, each world industry q is weighted by the industry's relative market value (in current U.S. dollars). This measure is the parallel to BHLS's global growth opportunities ("GGO") measure.

[8] A measure of *net* cross-country claims is not appropriate since a country with zero net claims on foreign residents could be a country with large foreign equity asset holdings financed with foreign debt liabilities. See Borio and Disyatat (2011) for a discussion of the limitations of using measures of external net claims.

[9] We thank Philip Lane for providing us with the data for 2008–2010.

3. The evolution of worldwide IPO activity and the decline in the U.S. share of IPOs

Panel A of Table 1 shows the total number of IPOs and breaks it down by domestic IPOs and global IPOs by year. Annual IPO counts increase from less than 1,000 in the early 1990s to a peak of 3,089 in 1996. They decrease after 1996 before reaching another peak of 2,113 in 2000. The counts fall for three years after 2000, increase again steadily to reach another peak in 2007, then collapse again

Table 1
The IPO sample: 1990–2011.
The initial sample includes 45,167 observations from 1990 to 2011 that SDC identifies as an IPO. IPOs with a single domestic tranche flagged as a private placement, global offers with tranches that have issue dates 30 or more days apart, transactions that do not contain any information on proceeds raised or SIC codes, and IPOs by REITs and investment funds are excluded. IPOs where the country of origin has no data and IPOs from countries where there were no domestic IPOs (only global IPOs) during the sample period are also excluded. SDC records data for some IPOs over multiple lines. These observations are consolidated into one line. The final sample includes 33,061 IPOs from 88 countries. Of these, 26,670 are domestic IPOs and 6,391 are global IPOs (including international IPOs and foreign IPOs). Panel A shows IPO counts and Panel B shows IPO proceeds. Domestic IPO proceeds do not include proceeds raised in the domestic tranche of global IPOs. For global IPOs, the panel reports total proceeds raised in global IPOs (proceeds raised in the domestic and foreign tranches) and global proceeds raised in global IPOs (proceeds raised in the foreign tranches only). Proceeds are in constant 2007 U.S. dollars (billions).

	Panel A: IPO counts		
Year	All IPOs	Domestic IPOs	Global IPOs
1990	300	248	52
1991	891	804	87
1992	1,336	1,211	125
1993	2,076	1,859	217
1994	2,724	2,469	255
1995	2,680	2,430	250
1996	3,089	2,758	331
1997	1,949	1,573	376
1998	1,229	920	309
1999	1,586	1,005	581
2000	2,113	1,450	663
2001	960	787	173
2002	910	806	104
2003	897	802	95
2004	1,521	1,297	224
2005	1,468	1,227	241
2006	1,664	1,318	346
2007	1,840	1,115	725
2008	699	440	259
2009	646	447	199
2010	1,398	952	446
2011	1,085	752	333
Total	33,061	26,670	6,391

	Panel B: IPO proceeds			
Year	All IPOs	Domestic IPOs	Global IPOs: total	Global IPOs: foreign tranches only
1990	$29.3	$18.5	$10.8	$8.5
1991	$71.7	$37.9	$33.8	$17.4
1992	$60.5	$35.5	$25.0	$10.4
1993	$147.1	$91.9	$55.2	$26.6
1994	$147.2	$75.4	$71.8	$37.8
1995	$115.6	$47.0	$68.6	$34.7
1996	$165.6	$79.1	$86.5	$45.1
1997	$178.9	$69.1	$109.8	$49.0
1998	$137.8	$32.5	$105.3	$39.5
1999	$206.6	$59.0	$147.6	$57.3
2000	$241.9	$51.5	$190.4	$94.0
2001	$106.9	$34.5	$72.4	$32.0
2002	$76.2	$46.4	$29.7	$16.3
2003	$57.9	$33.7	$24.3	$15.9
2004	$133.0	$61.9	$71.2	$45.0
2005	$149.1	$82.8	$66.4	$51.9
2006	$221.3	$123.4	$97.9	$85.8
2007	$277.8	$89.8	$188.0	$168.2
2008	$83.0	$22.9	$60.0	$34.9
2009	$95.6	$47.8	$47.8	$45.8
2010	$233.9	$99.8	$134.1	$110.0
2011	$126.4	$65.0	$61.5	$60.3
Total	$3,063.4	$1,305.3	$1,758.1	$1,086.2

Table 2
IPO activity for the top 25 countries around the world: 1990–2011.

IPO data are from SDC and include 33,061 IPOs from 88 countries over the period from 1990 to 2011. Panel A lists the top 25 countries based on total (domestic plus global) IPO counts. Panel B lists the top 25 countries based on total IPO proceeds. Domestic IPO proceeds do not include proceeds raised in the domestic tranche of global IPOs. For global IPOs the panel reports total proceeds raised in global IPOs (proceeds raised in the domestic and foreign tranches) and global proceeds raised in global IPOs (proceeds raised in the foreign tranches only). Proceeds are in constant 2007 U.S. dollars (billions).

Country	*Panel A: IPO counts*		
	All IPOs	Domestic IPOs	Global IPOs
United States	6,446	5,222	1,224
India	5,024	4,777	247
China	2,799	2,073	726
Canada	2,444	2,041	403
Japan	2,354	2,246	108
Australia	1,841	1,639	202
United Kingdom	1,688	1,370	318
South Korea	1,007	978	29
Taiwan	992	975	17
Hong Kong	929	559	370
France	826	562	264
Malaysia	796	739	57
Germany	606	297	309
Singapore	560	446	114
Thailand	456	355	101
Indonesia	346	239	107
Poland	308	252	56
Italy	256	58	198
Pakistan	254	252	2
Greece	195	152	43
Norway	194	128	66
Sweden	177	75	102
Israel	166	21	145
Brazil	159	61	98
Philippines	130	73	57
Total: top 25	*30,953*	*25,590*	*5,363*
Rest of world	*2,108*	*1,080*	*1,028*
Total: all countries	*33,061*	*26,670*	*6,391*

Country	*Panel B: IPO proceeds*			
	All IPOs	Domestic IPOs	Global IPOs: total	Global IPOs: foreign tranches only
United States	$734.8	$420.8	$314.0	$63.4
China	$449.2	$237.3	$211.9	$188.5
Japan	$221.1	$138.1	$83.0	$27.2
United Kingdom	$195.4	$72.2	$123.2	$70.4
France	$116.4	$10.0	$106.4	$54.1
Germany	$111.7	$30.0	$81.7	$47.7
Hong Kong	$96.9	$13.1	$83.8	$71.9
Italy	$86.8	$9.8	$77.1	$34.9
Australia	$86.0	$35.4	$50.7	$27.5
Canada	$73.7	$44.9	$28.8	$23.0
South Korea	$67.7	$53.0	$14.8	$9.6
Brazil	$62.9	$14.9	$48.0	$46.9
Russian Federation	$51.5	$13.9	$37.6	$37.6
Spain	$48.5	$3.3	$45.2	$24.8
India	$47.7	$18.0	$29.7	$26.1
Switzerland	$46.8	$9.8	$37.0	$29.7
Netherlands	$44.6	$4.1	$40.5	$33.3
Sweden	$32.9	$3.5	$29.4	$17.1
Taiwan	$29.3	$27.2	$2.1	$2.1
Indonesia	$28.6	$7.2	$21.4	$15.9
Malaysia	$28.2	$12.1	$16.1	$12.8
Bermuda	$27.4	$0.1	$27.3	$27.3
Singapore	$26.7	$8.8	$18.0	$15.8
Thailand	$24.0	$11.4	$12.7	$7.0
Poland	$23.9	$5.3	$18.6	$12.9
Total: top 25	*$2,763.0*	*$1,204.3*	*$1,558.7*	*$927.3*

Table 2 (*continued*)

Country	Panel B: IPO proceeds			
	All IPOs	Domestic IPOs	Global IPOs: total	Global IPOs: foreign tranches only
Rest of world	*$300.4*	*$101.0*	*$199.4*	*$158.9*
Total: all countries	*$3,063.4*	*$1,305.3*	*$1,758.1*	*$1,086.2*

before recovering by 2011. Panel A also shows that the rise and fall in annual counts prior to 2003 occurs for both domestic and global IPOs. The surge in overall counts after 2003 is much more dramatic for global IPOs. For domestic IPOs, 2007 does not exceed the earlier peaks, while the count for global IPOs in 2007 is higher than in any other year in the sample period. During the recent crisis, in fact, domestic IPOs reached their second lowest count during the sample (440 in 2008).

The results for IPO proceeds are presented in Panel B of Table 1. We obtain proceeds in U.S. dollars from SDC and convert them into constant 2007 values using U.S. inflation rates from the World Bank's WDI database. Panel B shows that total annual IPO proceeds rise during the 1990s to reach a peak of $242 billion in 2000. Annual proceeds decline to $58 billion by 2003 and then rise again, reaching a peak of $278 billion in 2007. Domestic IPO proceeds are less volatile over the period, so that changes in annual proceeds from global IPOs are the more important factor in the steady rise of total IPO proceeds during the 1990s and especially in the rapid expansion after 2003. In 2007, proceeds raised in global IPOs are $188 billion and these proceeds account for almost 68% of all IPO proceeds raised that year. The last column of Panel B shows total proceeds from foreign IPOs and from the foreign tranches of international IPOs. As a percentage of total proceeds raised in global IPOs, proceeds specifically raised in foreign markets are 50% of global proceeds on average in the 1990s, but rise to 72% in the 2000s with a peak in 2011 of 98%.

There are some important differences in the evolution of the counts and the proceeds of both domestic and global IPOs. In the 1990s, there is a dramatic increase in counts that is driven by an increase in domestic IPOs. The number of domestic IPOs peaks in 1996 and does not come close to that peak again in subsequent years. In fact, after 2000, the count never exceeds even half the peak reached in 1996. In contrast, however, domestic IPO proceeds in 2006 and in 2010 exceed the peak domestic IPO proceeds in the 1990s. There is a steady increase in the number of global IPOs until 2000. The count then drops, increases again after 2003, and finally peaks for the sample period in 2007. Proceeds that are raised in global IPOs increase throughout the 1990s to reach a peak in 2000. They collapse to a trough in 2003, and then increase sharply to reach a peak in 2007. Total proceeds from global IPOs in 2000 and 2007 are roughly similar, but proceeds from foreign IPOs and the foreign tranches of international IPOs peak in 2007 and are much higher in that year than in any other prior year.

Panel A of Table 2 shows the cross-country pattern in annual IPO counts. Developed countries with the largest economies and capital markets in the world, such as the U.S. (6,446 IPOs), Canada (2,444), Japan (2,354), Australia (1,841), U.K. (1,688), and Hong Kong (929), have the highest overall counts, but a number of emerging countries such as India (5,024), China (2,799), South Korea (1,007), and Taiwan (992) have high counts as well. Twenty countries are in the top 25 for both counts and proceeds. Panel B shows that the U.S. total of $735 billion constitutes 24% of the total worldwide IPO proceeds of $3.06 trillion over the period from 1990 to 2011. The other major markets include China ($449 billion, 15%), Japan ($221 billion, 7%), U.K. ($195 billion, 6%), and are followed by France, Germany, Hong Kong, and Italy, all under 5%. Some countries that are in the top 25 for counts are not in the top 25 for proceeds (Greece, Israel, Norway, Pakistan, and Philippines), whereas some countries are in the top 25 for proceeds but not for counts (Bermuda, Netherlands, Russia, Spain, and Switzerland).

The country-by-country averages hide dramatic changes in the frequency of IPOs across countries and over time. In addition to showing the counts for all IPOs across the world, Panel A of Fig. 1 shows the counts for the U.S., the U.K., and China. The U.S. dominates the U.K. and China in counts until 2001 when the counts are roughly the same and stay that way until 2008, after which China dominates the total counts. The U.S. counts peaked in 1996, but the number of U.S. IPOs has been small compared to that peak since 2001. If at one point in time the U.S. was the "land of the IPO," it is no longer so in the 2000s if one focuses on IPO counts. One way to see this is that the U.S. share of total IPO counts exceeds 20% in each of the first ten years of the sample except for 1994–1995 when it is 19%. It never exceeds 14% after 2001. In the 1990s, the U.S. share of total IPO counts is much larger than that of the U.K. and China, both of which had shares at or below 10% each year in the 1990s. Though the shares of these countries increase in the 2000s, the U.S. share ceases to dominate the others mostly because the number of U.S. IPOs is so much lower in the 2000s. Japan, Australia, Taiwan, and Korea all experience substantial increases in counts as well (not shown on the figure).

There was also a dramatic shift in the composition of IPO proceeds over the past two decades. The U.S. share of total IPO proceeds declined from about 30% in the 1990s to only 22% in the 2000s (through 2011, at least). The U.K. also experienced a decline from 12% to 5%. Among the other large markets, no major shift in market share arises (e.g., Canada, France, Italy, and Germany), except for China, which quadruples from a 5% to a 21% share ($377 billion out of the $1.8 trillion). China's total IPO proceeds now cumulatively exceed those of the U.S. since 2000 (see Panel

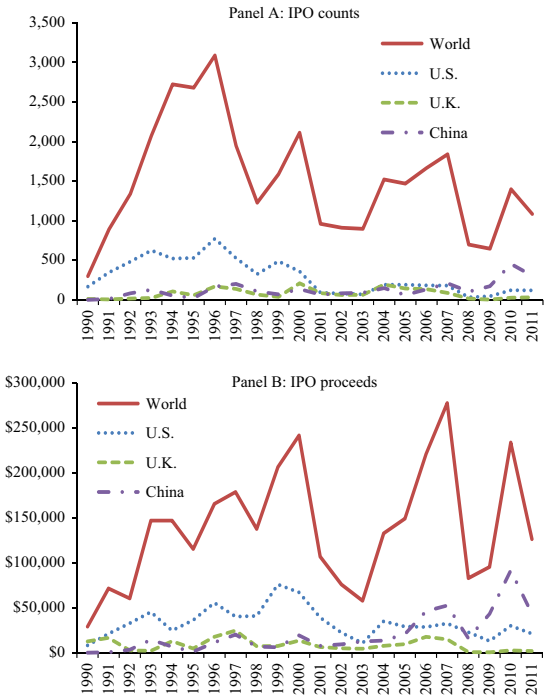

Fig. 1. Total IPO activity: 1990–2011. This figure shows annual IPO activity for all countries (World), the U.S., U.K., and China from 1990 to 2011. IPO data are from SDC and include 33,061 domestic and global IPOs from 88 countries over the period from 1990 to 2011. Panel A shows the total number of IPOs (domestic and global) each year. Panel B shows total IPO proceeds raised (domestic and global) each year. Proceeds are in constant 2007 U.S. dollars (millions).

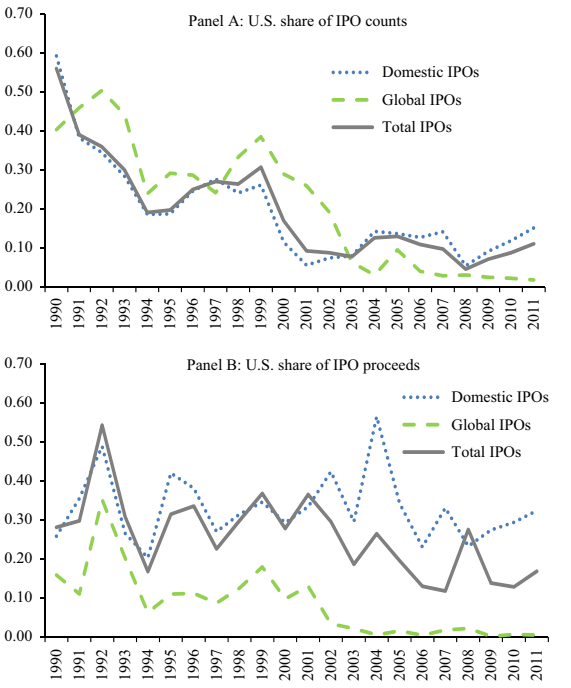

Fig. 2. The U.S. share of world IPO activity. This figure shows the annual share of IPO activity for U.S. firms relative to firms in the rest of the world from 1990 to 2011. IPO data are from SDC and include 26,670 domestic IPOs and 6,391 global IPOs from 88 countries. Panel A shows the number of U.S. IPOs scaled by the number of IPOs by firms from around the world. Panel B shows IPO proceeds raised by U.S. firms scaled by IPO proceeds raised by firms from around world. Domestic IPO proceeds do not include proceeds from the domestic tranche of global IPOs. Global proceeds include proceeds raised in the foreign tranches of the IPO. Proceeds and GDP are in constant 2007 U.S. dollars (millions).

B). Because of the dramatic changes in China's IPO market, we perform supplementary tests throughout our study for a sample that excludes Chinese IPOs.

Fig. 2 shows the evolution of the U.S. share of IPO counts and proceeds relative to that of the world over time. The statistics are reported separately for domestic IPOs, global IPOs, and total IPOs. The decreased importance of U.S. IPOs occurs at different times for counts versus proceeds. Regardless of IPO type, the U.S. share of IPO counts (Panel A) decreases sharply until 1994. After that year, it increases until 1999 and then collapses rapidly starting in 2000. It stays steadily low in the 2000s. In contrast, U.S. IPO proceeds (Panel B) mostly parallel the world's proceeds until 2002, at which point the world IPO proceeds grow rapidly and the U.S. IPO proceeds do not. The decline in the U.S. share of proceeds is less dramatic and is primarily due to a decline in its share of proceeds raised in foreign tranches in global IPOs from around 10% in the 1990s to a negligible fraction after 2001. It appears that in most years the U.S. has had at least one large IPO in the 2000s (e.g., Google's $1.7 billion in 2004, Dollar General's $716 million in 2009, and General Motors' $18.1 billion in 2010) to help maintain its domestic share of proceeds. One exceptional year is 2008 during which the U.S. share of total IPOs rises above 30% due to an unusually large $17.2 billion (in 2007 dollars) IPO by Visa.

The evidence in this section shows that IPOs in the rest of the world became much more important and that the U.S. share of world IPOs fell. One possible explanation is that country affiliations simply became less important because increasing financial globalization enabled firms wanting to pursue IPOs to find ways to avoid being hindered by national institutions obstacles. For instance, firms can use global markets to go public and avoid the constraints of their home country's rules and regulations. A second possibility is that there is a "catching-up" effect. Other countries had lower rates of IPO activity in the past and are simply catching up in the 2000s for reasons that have little to do with the quality of national institutions. There is, after all, a vast literature that focuses on the role of investor sentiment and growth opportunities for IPOs (Loughran and Ritter, 1995; Ritter, 2003), which may have influenced why IPO activity in the U.S. was more robust in the 1990s. A third possibility is that market conditions were relatively more attractive in the U.S. in the 1990s and became relatively more attractive in other countries in the 2000s. We address these issues in the following sections.

4. How are national institutions and market conditions related to IPO activity around the world?

To assess the importance of national laws and governance institutions, like corporate laws, securities laws, and the rule of law, as well as market conditions, such as economic growth and equity valuations in a country, we need to benchmark IPO activity in terms of both counts

and proceeds relative to the extent of potential activity. The literature uses different approaches to gauge this potential activity. Previous work on IPO activity benchmarks counts relative to the population in a given country (LLSV) and the number of listed firms on the major exchanges (DLLS). Each choice has its advantages. We choose the latter because some of our country-level measures of economic development use population as a divisor which could lead to a mechanical relation statistically. IPO activity in terms of the proceeds of equity issued by newly listed firms in a country is benchmarked relative to GDP by LLS and DLLS and relative to the total assets of the firms involved in raising capital (Kim and Weisbach, 2008). The lagged market capitalization of listed firms would be a choice of normalization that would be consistent with our normalization for counts. However, some of the countries in our sample have very few public firms early in the sample period. If there is an especially large IPO in a year, ratios that involve assets or market capitalization of listed firms become outliers. We therefore choose to use inflation-adjusted GDP to normalize proceeds.

Table 3 presents summary statistics by year for domestic IPO counts as a fraction of the previous year's number of domestic listed firms (Panel A) and for domestic IPO proceeds as a fraction of the previous year's GDP in millions of U.S. dollars (Panel B). Domestic IPO proceeds include proceeds from domestic IPOs only. We multiply both ratios by 100. An issue with using proceeds in our regressions is that there are some enormous IPOs. These mega-IPOs generate country-year outliers that can potentially distort inferences. For example, in 1998, NTT Mobile raised $23 billion (in 2007 dollars), accounting for 89% of total IPO proceeds raised by Japanese firms that year. In contrast, the other 83 Japanese IPOs that year raised an average of $34 million. Therefore, we report results where we winsorize IPO proceeds across the sample of IPO deals at the top 5% and later discuss how the results differ without winsorizing the proceeds. For counts, ratios are winsorized at the 1% and 99% thresholds across all country-years. We restrict the analysis to countries used in Tables 1 and 2 with sufficient data on the market conditions proxies.[10]

Panel A of Table 3 shows that domestic IPO activity by count ranges from a low of 0.43% of listed firms in 1990 to a high of 5.20% in 1994. We report means across countries and it should be noted that there is significant dispersion in activity across countries by year and, moreover, that the number of countries with nonzero IPO counts changes over time. Fewer countries have no IPOs when IPO markets are hot around the world than when they are cold. Specifically, the number of countries that have no IPOs in a year is negatively correlated with the worldwide average of IPOs per number of listed firms. World market conditions undoubtedly play an important role in IPO activity at the country level. We provide more such evidence in regressions that analyze country-level IPO rates.

[10] An important control variable in our tests is country *q*. We require that a country have these data for at least one year to be included in Table 3. This restriction eliminates 35 countries constituting only 371 domestic and 108 global IPOs.

Table 3
Domestic IPO activity: 1990–2011.

IPO data are from SDC and include 26,299 domestic IPOs from 53 countries that have data for GDP and country *q* for at least one year during the sample period from 1990 to 2011. For each country, domestic IPO counts and proceeds are summed annually. Panel A shows annual summary statistics for domestic IPO counts scaled by the lagged number of domestic firms. Panel B shows annual summary statistics for domestic IPO proceeds (winsorized at the top 5%) scaled by lagged GDP. Both measures are multiplied by 100. Domestic IPO proceeds do not include proceeds from the domestic tranche of global IPOs. The count measure is winsorized at the 1st and 99th percentiles. Country-years with no data for the number of domestic firms or GDP are excluded.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Panel A: Domestic IPO counts scaled by the lagged number of domestic firms																						
Mean	0.43	2.74	3.84	4.28	5.20	2.71	3.25	3.15	1.86	2.32	2.90	1.61	1.56	1.48	2.10	2.13	2.27	2.22	0.81	0.80	1.87	1.22
Median	0.00	0.00	0.78	0.91	1.86	1.08	0.98	0.77	0.57	0.36	0.85	0.00	0.30	0.00	0.41	1.09	1.38	1.25	0.00	0.16	0.60	0.34
Std deviation	0.94	4.85	5.65	6.04	6.37	4.26	5.07	4.86	3.01	3.47	4.21	2.57	2.42	2.67	3.29	2.90	2.45	3.33	1.54	1.36	3.66	2.25
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	3.70	20.69	20.69	20.69	20.69	20.69	20.69	20.69	12.83	15.16	16.90	10.92	10.10	14.73	13.75	13.86	10.04	19.48	7.32	7.05	20.12	12.12
# Of countries with zero IPOs	33	25	21	17	15	22	22	16	21	24	19	29	25	28	19	16	13	12	28	24	14	22
Panel B: Domestic IPO proceeds scaled by lagged GDP																						
Mean	0.03	0.11	0.14	0.19	0.21	0.10	0.13	0.13	0.05	0.13	0.11	0.04	0.06	0.06	0.08	0.11	0.10	0.10	0.02	0.02	0.05	0.04
Median	0.00	0.00	0.01	0.03	0.02	0.01	0.01	0.02	0.01	0.02	0.03	0.00	0.00	0.00	0.00	0.06	0.08	0.05	0.00	0.00	0.01	0.00
Std deviation	0.11	0.22	0.27	0.35	0.31	0.14	0.24	0.24	0.10	0.34	0.21	0.08	0.11	0.12	0.13	0.14	0.09	0.18	0.04	0.05	0.12	0.08
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.58	0.87	1.28	1.52	1.20	0.49	1.18	1.16	0.50	2.17	1.12	0.30	0.52	0.58	0.52	0.55	0.39	1.20	0.18	0.26	0.82	0.47
# Of countries with zero IPOs	38	30	25	20	19	23	23	17	21	24	19	29	25	28	19	16	13	12	28	24	14	22

Panel B of Table 3 shows that domestic IPO proceeds as a fraction of GDP ranges from a low of 0.02% in 2008–2009 to a high of 0.21% in 1994. The time-variation of IPO proceeds across years closely follows the pattern in counts per number of listed firms, but not perfectly. This fact implies that there are interesting differences in the offering sizes of IPOs across years, part of which stem from the types of firms that go public and part of which stem from the countries of domicile that dominate IPO activity in those years. When we do not winsorize IPO proceeds at the top 5% to cap the values for the proceeds of the very large IPOs in our sample (not shown), the time-series variation across years is similar. The only exception is when the ratios diverge from 2005 to 2007. It turns out that winsorized IPO proceeds as a fraction of GDP remain flat, at around 0.10%, but the ratio for IPO proceeds that are not winsorized rises to 0.20%. It is important to point out that the range of this fraction – however it is measured – is limited by the fact that proceeds are typically small relative to the GDP of a country. The maximum fraction of IPO proceeds in any country never exceeds 2% in any year. Again, each year there is a substantial fraction of countries that are counted in these means for which there are no IPO proceeds.

4.1. Understanding domestic IPO activity

Everything else being equal, we expect more IPOs in countries with better growth opportunities, with more economic development, and with higher financial development. We use GDP growth as a measure of growth opportunities, log(GDP/capita), market cap/GDP, and market turnover as measures of the level of economic and financial market development, and country q as a measure of corporate valuations in the country. Since we expect greater financial globalization to make it easier for firms to use global IPOs to go public, and thereby to rely less on raising capital using a domestic IPO, we include world financial globalization as an explanatory variable.[11] Each of these variables is lagged by one year. Lagging these variables is especially important for market capitalization and turnover since these variables would be directly affected by IPO activity. We estimate this model as a panel regression using ordinary least squares allowing the standard errors to be clustered by country.

Table 4 presents the estimates for regressions that project measures of domestic IPO activity on measures of national institutions, financial globalization, development, and market conditions. The first six regressions use domestic IPO counts normalized by the lagged number of listed firms as the measure of IPO activity. Model (1), our base specification without any of the institutions variables included, shows that world financial globalization has a negative coefficient, −1.203, that is statistically significant and economically important. An increase from the average fraction of 139% of external assets and liabilities to world GDP in the 1990s to an average of 289% in the 2000s is associated with a 1.80% decrease in the domestic IPO rate, a large decline which represents 60% of the unconditional average annual IPO rate in the 1990s. The domestic IPO rate increases in country q. The coefficient of 1.537 implies that a one standard deviation increase in q (0.36) is associated with a 0.55% increase in the IPO rate, which constitutes 14% of its standard deviation. Similarly, GDP growth and market turnover have positive coefficients that are significant at the 1% level. Finally, neither of the coefficients on market cap/GDP or, log(GDP/capita), is statistically significant. The explanatory power of this specification is reasonable with an adjusted R^2 of 15.3%.

Model (7) presents the results of the same base regression for domestic IPO proceeds normalized by lagged GDP. The results are similar to those for counts. In this specification, world financial globalization also has a negative coefficient that is statistically and economically significant. An expansion of external assets/liabilities as a fraction of world GDP from 139% in the 1990s to 289% in the 2000s is associated with a decline of 0.083%, which is about 68% of the average annual IPO rate during the 1990s and is 44% of the unconditional standard deviation of domestic IPO proceeds. As with counts, the coefficients on country q and GDP growth are positive and statistically significant. The coefficient on country q has a larger economic magnitude corresponding to about 11% of the standard deviation of the IPO rate for proceeds. The coefficient on market turnover is positive and significant at the 5% level and for market cap/GDP at 1%. The coefficient on the log of GDP per capita is negative and significant at the 10% level. The explanatory power of this base specification is again reasonable with an adjusted R^2 of 17.9%.

4.2. National laws and governance institutions and domestic IPO activity

Models (2)–(6) and (8)–(12) each add to the base specifications of domestic IPO counts and proceeds, respectively, a country-level measure of laws and governance institutions, one at a time. In the introduction, we discussed the existing theoretical literature that predicts institutions become less important with financial globalization. To test this prediction, we allow our measure of world financial globalization to interact with the institutions variables ("Institutions × globalization"). To preserve the interpretability of the actual level coefficients on the institutions variables and globalization, we de-mean the interacted variables across countries (each of the institution variables, in turn) and across years (world financial globalization variable).[12]

[11] The world financial globalization has no variation across countries in a given year. Therefore, we cannot include year dummies in these regressions.

[12] Without de-meaning, the coefficient on the institutions variable in the regression with the interaction corresponds to the partial derivative of the dependent variable with respect to the institutions variable when the world financial globalization measure equals zero. This differs from the interpretation of the institutions variable in a regression without the interaction, where the interpretation of the coefficient on the institutions variable is the partial derivative when the world financial globalization measure is at its mean. By de-meaning, the interpretation of the coefficient on the institutions variable in the regression with the interaction is the same as that in regression without the interaction. See Ozer-Balli and Sorensen (2013).

Table 4
Institutions, financial globalization, and domestic IPO activity.

The dependent variable is each country's annual measure of domestic IPO activity. IPO data are from SDC and include 26,299 domestic IPOs from 53 countries that have data available for GDP and country *q* for at least one year during the sample period from 1990 to 2011. For each country, domestic IPO counts and proceeds are summed annually. Panel A shows regressions where the dependent variable is domestic IPO counts scaled by the lagged number of domestic firms. Panel B shows regressions where the dependent variable is domestic IPO proceeds (winsorized at the top 5%) scaled by lagged GDP. Domestic IPO proceeds do not include proceeds from the domestic tranche of global IPOs. Both measures of domestic IPO activity are multiplied by 100. The count measure is winsorized at the 1st and 99th percentiles. Country-years with no data for the number of domestic firms or GDP are excluded. With the exception of the institutions variables, all variables are lagged by one year. Variables are defined in Table A1. The *t*-statistics are adjusted for clustering by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Domestic IPO counts						*Panel B: Domestic IPO proceeds*					
	(1)	Common law (2)	Anti-self-dealing (3)	Disclosure (4)	Liability standards (5)	Rule of law (6)	(7)	Common law (8)	Anti-self-dealing (9)	Disclosure (10)	Liability standards (11)	Rule of law (12)
Constant	2.235	−1.038	−0.169	−1.533	−1.521	2.287	0.182**	0.021	0.079	0.019	0.010	0.158
	(1.28)	(−0.51)	(−0.10)	(−0.87)	(−0.98)	(0.82)	(2.26)	(0.22)	(0.99)	(0.22)	(0.14)	(1.13)
Institutions		1.188*	4.214***	5.440***	1.883*	0.503		0.078***	0.218***	0.209***	0.064*	0.018
		(1.79)	(4.05)	(4.66)	(1.74)	(1.30)		(2.84)	(4.23)	(3.38)	(1.73)	(1.02)
Institutions × globalization		−1.631***	−2.514***	−3.554***	−2.094***	0.088		−0.094***	−0.196***	−0.190***	−0.104***	0.003
		(−3.57)	(−4.00)	(−4.21)	(−2.75)	(0.44)		(−3.90)	(−4.01)	(−3.48)	(−3.25)	(0.32)
World financial globalization	−1.203***	−1.186***	−1.075***	−1.069***	−1.192***	−1.076***	−0.055***	−0.054***	−0.048***	−0.049***	−0.054***	−0.050***
	(−5.49)	(−6.15)	(−6.38)	(−5.78)	(−5.97)	(−4.38)	(−4.72)	(−5.62)	(−6.61)	(−5.23)	(−4.84)	(−3.79)
Country *q*	1.537**	1.528**	1.569**	1.528*	1.413	1.486**	0.056*	0.056*	0.056	0.063	0.062	0.054*
	(2.12)	(2.30)	(2.14)	(1.91)	(1.63)	(2.16)	(1.74)	(1.82)	(1.66)	(1.48)	(1.46)	(1.71)
GDP growth	0.163***	0.154**	0.115**	0.088**	0.128***	0.162***	0.010***	0.009***	0.007***	0.007***	0.008***	0.010***
	(2.89)	(2.61)	(2.36)	(2.17)	(2.80)	(2.78)	(3.30)	(3.06)	(2.97)	(2.89)	(2.99)	(3.21)
Market cap/GDP	0.553	0.250	−0.032	−0.010	0.569	0.491	0.061***	0.041**	0.032*	0.039*	0.061**	0.059***
	(1.54)	(0.75)	(−0.10)	(−0.03)	(1.51)	(1.38)	(2.75)	(2.30)	(1.95)	(1.95)	(2.61)	(2.70)
Market turnover	1.349***	1.411**	1.296***	0.729	0.915**	1.303**	0.049**	0.052**	0.047***	0.022	0.029*	0.047**
	(2.73)	(2.64)	(2.76)	(1.51)	(2.03)	(2.55)	(2.57)	(2.52)	(2.68)	(1.52)	(2.01)	(2.51)
Log (GDP/capita)	−0.103	−0.020	−0.078	0.120	0.061	−0.392	−0.016*	−0.010	−0.015*	−0.008	−0.010	−0.026*
	(−0.48)	(−0.08)	(−0.41)	(0.68)	(0.33)	(−1.29)	(−1.77)	(−1.01)	(−1.87)	(−0.99)	(−1.25)	(−1.81)
Number of observations	1,096	1,096	1,096	951	951	1,096	1,096	1,096	1,096	951	951	1,096
Adjusted R^2	0.1534	0.1966	0.2246	0.2549	0.1772	0.1563	0.1792	0.2491	0.2891	0.2481	0.1888	0.1801

First, the coefficient for the financial globalization variable diminishes slightly in magnitude, but remains negative and statistically significant at the 1% level when we add these institutions variables and the interactions. Perhaps not surprisingly, since institutions are correlated with financial development, we note that the measures of financial development (like Market cap/GDP and Market turnover) weaken in some specifications when we include the institutions variables.

A key finding is that higher quality national institutions lead to higher levels of domestic IPO activity. In models (2) and (8), the additions of the common law dummy and the interaction with financial globalization add explanatory power to the base model. The coefficient on the common law dummy itself is positive and significant at the 10% level with a value of 1.188 for domestic IPO counts and positive and significant at the 1% level with a value of 0.078 for domestic IPO proceeds. The adjusted R^2 increases substantially to 19.7% (from 15.3% in the base specification) for counts and to 24.9% (from 17.9%) for proceeds. LLSV find similar results using counts of IPOs per millions in population for a two-year period, 1995–1996. In contrast to their approach, we use a panel regression and account for market conditions. The positive coefficient on the anti-self-dealing index is positive and significant at the 1% level for both IPO counts and proceeds in models (3) and (9). For counts, the coefficient of 4.214 implies that a one standard deviation higher score on the anti-self-dealing index (say, from that of Switzerland to Canada) is associated with an increase of 1.01% in the domestic IPO rate, or 26% of its standard deviation. The economic magnitude of this variable is similar for proceeds.[13]

The next regressions include the securities laws measures developed in LLS. We include the indexes for disclosure and for liability standards in models (4), (5), (10), and (11). LLS show these variables, separately and together, to be statistically and economically important for explaining IPO activity measured by proceeds for the high IPO activity period of 1996–2000 (their Tables 3 and 5). We similarly find that the coefficients on these variables are important for both IPO counts and proceeds. For example, disclosure has a coefficient of 5.440 (t-statistic of 4.66) for IPO counts; this implies that a one standard deviation higher score (say, from that of Turkey to Spain) is associated with a 1.13% higher domestic IPO rate, which represents about 29% of its standard deviation. The adjusted R^2 for this specification is 25.5%. Similarly strong results hold for the proceeds regression. The coefficient for the other index from LLS (2006) that we use, liability standards, is significant, but less reliably than disclosure. That the results for disclosure are particularly strong is important support for the key prediction in Stulz (2009), where credible disclosure commitment ex ante and ex post by means of strong securities laws is critical for the entrepreneur to maximize offering proceeds. We also examine the time-varying measure of the rule of law in models (6) and (12). There is evidence of a positive relationship, but it is not statistically reliable.

The other key finding in Table 4 is that the role of institutions weakens as financial globalization increases. The interaction of the common law indicator variable with financial globalization is reliably negative for counts in model (2) and for proceeds in model (8). A similar pattern arises for just about every national institutions proxy variable that has a reliably positive coefficient on the institutions variable itself. In particular, financial globalization sharply reduces the positive impact of the anti-self-dealing, disclosure, and liability standards variables in models (3), (4), and (5) for counts and in models (9), (10), and (11) for proceeds. Consider the economic importance of this phenomenon for the example of the specification with the anti-self-dealing index. In model (3), we showed that a one standard deviation higher index score in anti-self-dealing (such as, from Switzerland to Canada) is associated with a 1.01% higher domestic IPO rate measured by counts. Using the interaction, we can compute how *different* the impact of such a higher score is in the 1990s when the level of financial globalization was lower and in the 2000s when it was higher (139% vs. 289% of world GDP). A one standard deviation increase in financial globalization is associated with a 1.44% higher domestic IPO rate during the 1990s and with only a 0.58% higher rate during the 2000s. At the peak of financial globalization in our sample period, none of the institutions variables have any impact on the domestic IPO rate measured using counts. Similarly, when we consider the IPO rate measured using proceeds in Panel B, none of the institutions variables have a notable impact on the domestic IPO rate when financial globalization is at its peak.

5. Financial globalization and global IPO activity around the world

Our findings to this point broadly support the law and finance theories outlined in the introduction which predict a positive relation between IPO activity and the quality of institutions and a weakening role for institutions for domestic IPO activity as financial globalization increases. Recall from SW that firms are larger, more valuable, and greater in number with higher dividends and less diversion of profits if legal protections are better. An important corollary of the SW model, however, is that more open capital markets are associated with greater IPO activity in a given country and that any differences in investor protection laws across countries will diminish in importance. As shown in DKS and Stulz (2009), more open markets enable firms to take advantage of the financial development, the economic development, and the institutions of foreign countries.

In this section, we explore one possible explanation for our findings which is that any given country's institutions became less important because of the emergence of global IPOs. Financial globalization made it increasingly easy for firms wanting to pursue IPOs to avoid being hindered by domestic institutional obstacles and to benefit from

[13] In Table 6 of DLLS, the anti-self-dealing variable has a reliably positive coefficient of 4.14 for their specification on IPO proceeds relative to GDP, though with fewer control variables for the level of economic and financial development. They discuss the large economic significance of this variable (p. 449).

institutions and resources from countries other than their own.[14] We expect that, all else equal, poor institutions make it more likely that a firm will use a global IPO. Moreover, since access to global markets has high fixed costs, we also expect that a small firm going public is less likely to use a global IPO than a large firm. We investigate whether the use of global IPOs is related to firm size and to the quality of national institutions and whether or not this relationship changes over time with greater financial globalization. The sample of IPO firms is first divided into small- and large-firm IPOs and summary statistics reveal how actively they use global IPOs. We then estimate logistic ("logit") regression models of the choice between a global IPO and a domestic IPO.

5.1. Understanding global IPO activity

To distinguish between small and large IPO firms, we follow Gao, Ritter, and Zhu (2012) who consider firms to be small if they have sales of less than $50 million in 2009 dollars. Since pre-IPO sales data in SDC are often incomplete, we use market capitalization and/or total assets to define firm size. We have size data for 23,588 IPOs that account for 82% of total proceeds raised. Each year, we compute the mean values of total assets and market capitalization of U.S. firms in Standard and Poor's Compustat database with sales between $45m and $55m (in 2007 dollars). We use these values as cutoffs to define firms going public as small or large based on their pre-IPO total assets or market capitalization (IPO offer price times the number of shares outstanding after the offer). If a firm going public is below the cutoff for total assets or for market capitalization in a given year, it is classified as a small-firm IPO. Otherwise, it is a large-firm IPO. With this definition, of the 5,401 U.S. IPOs for which we have size data (out of 6,446 IPOs in total), 46% are classified as small-firm IPOs. This is roughly similar to the percentage of U.S. small-firm IPOs in Gao, Ritter, and Zhu (2012), whose sample period goes from 1980 to 2009. Over our full sample of 23,588 IPOs, 16,653 IPOs are classified as small-firm IPOs.

Two caveats are in order. First, if there are selection biases in SDC, especially early in the sample period, they are much more likely to affect small-firm IPOs than large-firm IPOs. Second, we caution that small firms going public in one country can differ from small firms going public in other countries (e.g., they might be too small to meet the listing requirements in other countries) and such differences could affect the relative IPO counts of these countries. Thus, it is useful to note that our results hold for both counts and proceeds for small-firm and large-firm IPOs. The results for proceeds and for large-firm IPOs are much less affected by selection bias or by differences among small-firm IPOs across countries. In addition, selection biases and differences in small public firms across countries will affect our results only to the extent that they change over time with financial globalization.

In Panel A of Table 5, we show the distribution of IPOs between small firms and large firms, the percentage of small firms (large firms) that use a global IPO, and the percentage of small firms (large firms) with a global IPO that pursue exclusively a foreign IPO. Only the top 25 countries based on counts and proceeds are presented (but these 25 countries account for 22,691 out of 23,588 IPOs in our sample). The overall percentage of large-firm IPOs for these countries is 29%, but this fraction varies widely across countries. The country with the smallest percentage of large-firm IPOs is India with 3%. In contrast, some countries have mostly large-firm IPOs. For instance, Brazil's percentage of large-firm IPOs is 81%. The percentage of large-firm IPOs that are global (32%) is much larger than the percentage of small-firm IPOs that are global (13%). For instance, 55% of the large-firm IPOs in Thailand are global IPOs, while only 15% of its small-firm IPOs are global IPOs. Over the full sample of countries, there are only nine countries for which less than half of the large-firm IPOs are global IPOs. In contrast, there are 27 countries for which less than half of the small-firm IPOs are global IPOs. It follows that the typical small-firm IPO is not a global IPO, while the typical large-firm IPO is a global IPO. The last two columns of the table report the percentage of foreign IPOs among the global IPOs for small and large firms. In 33 countries among the 51 that actually have both small-firm and large-firm global IPOs, small firms are more likely than large firms to pursue a global IPO that is a foreign IPO; foreign IPOs constitute 61% of small-firm global IPOs compared to only 42% among large-firms IPOs.

In Panel B of Table 5, we also report results for proceeds. The percentage of IPO proceeds that are from large firms is 83% across all 25 countries. Perhaps not surprisingly, the percentage of small-firm IPOs that are global IPOs appears even larger when we use proceeds instead of counts (40% versus 13%) indicating that the small firms with global IPOs are the larger firms among the set of small firms. The same result holds for large firms (63% versus 32%). With proceeds and unlike with counts, small firms are similar to large firms in that about 33% of global IPO proceeds come from foreign IPOs.

5.2. The determinants of global IPO activity

In Table 6, we report the results of logit regressions that investigate the determinants of a firm's choice between a global IPO and a domestic IPO. Since the U.S. is a target country for many global IPOs, we exclude it in this section and the next although our main conclusions are not sensitive to excluding specific countries, including the U.S. The sample includes 18,122 IPOs with complete data. The dependent variable equals one if a firm chooses a global IPO (3,800 observations) and zero if it chooses a domestic IPO (14,322 observations). The explanatory variables are the same as in Table 4 except that we also include an indicator variable for small firms and include world q as

[14] This benefit takes many forms. For 50 randomly chosen global IPOs in our sample, we investigated whether firms that use global markets for their IPOs also tend to use foreign auditors, law firms, and underwriters. We found that this is the case: firms that have global IPOs make use of monitors from outside of their country.

Table 5
Firm size and IPO activity for the top 25 countries around the world: 1990–2011.

IPO data are from SDC and include 23,588 IPOs (18,827 domestic IPOs and 4,761 global IPOs) from 53 countries that have data for GDP and country q for at least one year and have size data from 1990 to 2011. Each year, firms going public are classified as small vs. large. See Table A1 for details. Panel A lists the top 25 countries based on total IPO counts. Panel B lists the top 25 countries based on total IPO proceeds. Global IPOs include international IPOs (those with both domestic and foreign tranches) and foreign IPOs (those with a foreign tranche but no domestic tranche). Overall % is computed based on the full sample of IPOs considered in each column, e.g., in the first column of Panel A, it equals the number of large IPOs/the total number of IPOs. Proceeds are in constant 2007 U.S. dollars (billions).

	Panel A: IPO counts					
Country	Number of IPOs	% of IPOs that are large	% of small IPOs that are global	% of large IPOs that are global	Small global IPOs: % that are foreign	Large global IPOs: % that are foreign
United States	5,401	54.0%	12.2%	20.3%	19.7%	5.1%
India	4,744	3.1%	3.1%	58.1%	74.1%	66.3%
Japan	2,343	34.9%	2.5%	8.4%	2.6%	5.8%
China	1,900	35.3%	24.9%	44.3%	98.4%	94.9%
Australia	1,694	12.6%	7.5%	30.5%	80.2%	56.9%
United Kingdom	978	23.4%	11.6%	54.6%	65.5%	57.6%
France	679	19.0%	27.3%	61.2%	40.7%	21.5%
Canada	649	22.7%	54.0%	52.4%	98.2%	85.7%
Taiwan	581	18.9%	1.1%	8.2%	100.0%	88.9%
South Korea	527	17.5%	0.9%	14.1%	100.0%	38.5%
Germany	486	37.7%	51.5%	56.8%	19.9%	24.0%
Hong Kong	477	30.0%	40.7%	85.3%	56.6%	31.1%
Malaysia	390	10.3%	8.6%	45.0%	90.0%	44.4%
Singapore	331	12.1%	19.2%	70.0%	75.0%	28.6%
Thailand	229	21.4%	15.0%	55.1%	3.7%	25.9%
Italy	193	43.5%	75.2%	78.6%	31.7%	30.3%
Poland	182	13.2%	13.9%	58.3%	100.0%	78.6%
Indonesia	152	36.2%	13.4%	61.8%	61.5%	58.8%
Brazil	139	80.6%	70.4%	61.6%	84.2%	89.9%
Sweden	129	35.7%	50.6%	67.4%	45.2%	16.1%
Norway	107	43.0%	39.3%	45.7%	54.2%	42.9%
Greece	104	42.3%	10.0%	70.5%	50.0%	80.6%
Netherlands	103	55.3%	65.2%	94.7%	50.0%	53.7%
Mexico	87	69.0%	3.7%	55.0%	0.0%	18.2%
Israel	86	37.2%	87.0%	96.9%	95.7%	100.0%
Total	*22,691*					
Overall %		*28.6%*	*13.0%*	*32.3%*	*61.4%*	*42.1%*

	Panel B: IPO proceeds					
Country	IPO proceeds	% of IPOs that are large	% of small IPOs that are global	% of large IPOs that are global	Small global IPOs: % that are foreign	Large global IPOs: % that are foreign
United States	$646.2	86.0%	30.3%	41.0%	8.2%	2.1%
China	$366.3	74.4%	16.1%	63.8%	96.8%	60.3%
Japan	$220.4	89.9%	4.0%	41.3%	0.3%	2.0%
France	$112.3	87.5%	71.2%	94.6%	19.9%	5.9%
United Kingdom	$107.3	83.0%	34.2%	75.9%	43.3%	35.6%
Germany	$103.9	80.6%	73.4%	74.5%	15.0%	24.2%
Australia	$77.7	79.2%	24.8%	70.4%	61.6%	42.5%
Italy	$76.4	62.2%	89.9%	86.7%	2.9%	13.1%
Hong Kong	$75.9	90.3%	68.9%	98.9%	33.1%	19.2%
Brazil	$61.1	86.2%	76.7%	76.5%	92.4%	94.6%
Spain	$45.0	79.4%	91.7%	94.4%	3.7%	24.1%
India	$44.9	70.9%	29.0%	76.6%	80.7%	68.2%
Switzerland	$42.3	94.8%	61.8%	82.5%	33.8%	48.8%
Netherlands	$39.3	80.9%	93.1%	92.6%	29.1%	40.1%
South Korea	$39.0	78.1%	1.6%	44.8%	100.0%	8.0%
Russian Federation	$36.8	95.8%	64.7%	65.4%	91.0%	100.0%
Canada	$36.0	74.4%	48.3%	66.2%	89.3%	74.5%
Sweden	$28.5	89.9%	75.8%	93.0%	43.5%	20.7%
Bermuda	$22.5	97.6%	100.0%	100.0%	100.0%	99.8%
Malaysia	$19.4	83.9%	36.9%	82.4%	42.1%	39.8%
Mexico	$18.8	96.6%	33.4%	69.1%	0.0%	17.6%
Singapore	$17.5	77.6%	42.2%	94.6%	71.0%	27.5%

Table 5 (*continued*)

Country	Panel B: IPO proceeds					
	IPO proceeds	% of IPOs that are large	% of small IPOs that are global	% of large IPOs that are global	Small global IPOs: % that are foreign	Large global IPOs: % that are foreign
Poland	$16.9	73.4%	40.6%	93.1%	100.0%	55.3%
Norway	$16.8	88.1%	65.5%	79.7%	47.3%	33.5%
Belgium	$15.7	46.6%	89.4%	97.9%	4.1%	23.9%
Total	*$2,286.8*					
Overall %		*82.6%*	*39.9%*	*62.9%*	*32.5%*	*31.2%*

Table 6
Institutions, financial globalization, and the global versus domestic IPO choice.

This table presents logit regressions where dependent variable equals one for global IPOs and zero for domestic IPOs. Global IPOs include international IPOs (those with both domestic and foreign tranches) and foreign IPOs (those with a foreign tranche but no domestic tranche). IPO data are from SDC and include 18,122 IPOs (14,322 domestic IPOs and 3,800 global IPOs) by non-U.S. firms from 52 countries that have data for GDP and country *q* for at least one year and have size data from 1990 to 2011. With the exception of the institutions variables and the small-firm dummy, all variables are lagged by one year. Variables are defined in Table A1. The *t*-statistics are adjusted for clustering by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	Common law (2)	Anti-self-dealing (3)	Disclosure (4)	Liability standards (5)	Rule of law (6)
Constant	−0.394*	−0.472**	−0.548**	−0.579***	−0.536**	−0.470**
	(−1.74)	(−2.10)	(−2.14)	(−2.65)	(−2.45)	(−2.47)
Institutions		−0.692	−2.154**	−4.387***	−2.632***	−0.007
		(−1.37)	(−2.16)	(−3.81)	(−2.62)	(−0.01)
Institutions × globalization		1.304***	1.784***	4.951***	2.212***	−0.237
		(3.13)	(2.97)	(4.04)	(3.18)	(−0.66)
World financial globalization	0.923***	1.078***	1.036***	1.300***	1.166***	0.954**
	(3.60)	(4.36)	(3.74)	(5.14)	(4.64)	(2.47)
Small-firm dummy	−1.627***	−1.474***	−1.548***	−1.612***	−1.735***	−1.551***
	(−6.66)	(−6.77)	(−6.72)	(−7.38)	(−8.18)	(−8.06)
Country *q*	0.124	0.377	−0.003	0.461	0.373	0.153
	(0.21)	(0.82)	(−0.01)	(0.70)	(0.61)	(0.26)
World *q*	−0.208	−0.343	−0.530	−0.648	−0.863	0.113
	(−0.24)	(−0.39)	(−0.56)	(−0.51)	(−0.78)	(0.13)
GDP growth	0.026	0.022	0.046	−0.028	−0.001	−0.000
	(0.60)	(0.61)	(0.97)	(−0.59)	(−0.02)	(−0.01)
Market cap/GDP	0.108	0.179	0.295	0.415	0.337	0.162
	(0.38)	(0.61)	(1.05)	(1.51)	(1.48)	(0.60)
Market turnover	−0.533**	−0.507***	−0.614**	−0.691**	−0.717**	−0.592**
	(−2.11)	(−2.86)	(−2.50)	(−2.48)	(−2.36)	(−2.57)
Log (GDP/capita)	0.208	0.059	0.167	−0.009	0.169	0.205
	(1.34)	(0.42)	(1.17)	(−0.06)	(1.27)	(0.74)
Number of observations	18,122	18,122	18,122	15,946	15,946	18,122
Pseudo R^2	0.1722	0.2005	0.1898	0.2650	0.2447	0.1752

an additional control. As before, the *t*-statistics are adjusted for clustering by country.[15]

Interpreting regression coefficients in terms of marginal effects in nonlinear models, such as our logit model, can be difficult because the marginal effects are nonlinear functions of the coefficients and the levels of the explanatory variables. This makes it especially difficult to interpret interaction terms because the marginal effects differ for each observation (Ai and Norton, 2003) and statistical tests can be uninformative and misleading (Greene, 2010). A logit model, however, is linear in the log-odds metric. Therefore, the log-odds and, thus, the odds ratios (the exponentiated coefficients) represent the constant effect of a given variable on the likelihood of, say, a global IPO. We, therefore, report the regression coefficients, but interpret them in terms of odds ratios which are simpler to interpret when there are interaction terms in the model (see, e.g., Buis, 2010; Kolasinski and Siegel, 2010). To assess the economic significance of our results, we note that 79% of the IPOs in these regressions are domestic.

[15] Caglio, Hanley, and Marietta-Westberg (2012) employ a similar experiment at the deal level. They explore the effect of various firm and country characteristics on the decision to issue a domestic IPO, foreign IPO, or global IPO, but do not focus on the role of financial globalization or how it interacts with institutions and with firm size as we do.

The exponentiated coefficient on the constant term gives the baseline odds, which are the odds of a global IPO when all explanatory variables are zero. To ensure that the baseline odds are meaningful, we de-mean each of the explanatory variables except the small-firm dummy (this affects the coefficient and significance of the constant term only). Therefore, the baseline odds are the odds of a global IPO relative to a domestic IPO for a large firm when all other variables are at their average values. In model (1), the coefficient on the constant is −0.394 so that for large firms we expect 0.674 ($e^{-0.394}$) global IPOs for each domestic IPO. That is, the odds of a global IPO are 32.6% lower than the odds of a domestic IPO.

We expect that small firms are less likely to choose a global IPO. Consequently, the coefficient on the small-firm dummy should be negative. We find this to be the case and the effect is strong as the coefficient is always significant at the 1% level. In model (1), the coefficient on the small-firm dummy is −1.627 so that the odds of a global IPO by small firms are only 0.197 ($e^{-1.627}$) times the odds of large firms. Therefore, we expect 0.132 (0.674×0.197) global IPOs for each domestic IPO among small firms. Or put another way, the odds of a global IPO by small firms are 80.3% lower than the odds for large firms. We also find that global IPOs increase with the level of financial globalization. The coefficient on world financial globalization is 0.923 and it is statistically and economically significant. An increase in the extent of financial globalization from its average in the 1990s to its average in the 2000s increases the odds of a global IPO by a factor of 4.041, or by 304.1%.[16] This is an economically large effect. Among the other country variables, the only variable that is significant is stock market turnover, which has a negative coefficient. If a firm belongs to a country with higher turnover, it is less likely to choose a global IPO when it goes public.

In models (2) through (6) we add the institutions variables. In these regressions, the results for the small-firm dummy and globalization are similar to those reported in model (1). Each institutions variable has a negative coefficient and the coefficient is significant for three of them (anti-self-dealing, disclosure, and liability standards). This evidence supports the prediction that firms from countries with worse institutions are more likely to choose a global IPO than a domestic IPO. Looking at model (3), the coefficient on anti-self-dealing is −2.154. This implies that a one standard deviation increase in anti-self-dealing from, say, Switzerland to Canada (0.190), lowers the odds of a global IPO by a factor of 0.664, a decrease of 33.6%.

To examine whether the relation between the quality of institutions and the likelihood of a global IPO is affected by financial globalization, we interact the institutions variables with financial globalization. The coefficients on the interaction variables are positive and significant in four of the five regressions (the exception is the rule of law). Therefore, the quality of institutions is more weakly associated with the global IPO decision when financial globalization is higher. For example, in model (3), the coefficient on the interaction term is 1.784. This implies that a one standard deviation increase in the anti-self-dealing index in the 1990s decreases the odds of a global IPO by a factor of 0.456, or by 54.4%. In the 2000s, a similar one standard deviation increase in the anti-self-dealing index lowers the odds of a global IPO by a factor of only 0.761, or by 23.9%.[17]

6. Does financial globalization impact IPO activity for small and large firms differently?

There are at least two reasons to believe that the impact of financial globalization should differ between small and large firms. First, as discussed earlier, there are fixed costs to accessing global markets. As a result, doing so will be more valuable to large firms. However, these fixed costs are likely to fall with financial globalization as more firms make use of global IPOs. Second, foreign investors have historically been more focused on large firms (e.g., Kang and Stulz, 1997), so that the benefits that accrue to a firm from attracting foreign investors are likely to have been less important for small firms. But as financial globalization increases and the so-called "home bias" decreases, foreign investors could become interested in small firms as well as large firms.

To examine whether financial globalization has affected small and large firms differentially, we estimate logit regressions of the decision to have a global IPO where financial globalization is interacted with the small-firm dummy to assess whether the relation between the small-firm dummy and the likelihood of a global IPO changes as financial globalization increases. The regressions are similar to those in the previous section except that we omit the interactions with the institutions variables (otherwise, financial globalization would appear three times in each regression and inferences may become too fragile). As in Table 6, we exclude U.S. firms, de-mean each of the variables except the small-firm dummy, and cluster the standard errors by country.

Model (1) in Panel A of Table 7 has no institutions variable. As before, the likelihood of a global IPO rises with financial globalization and is lower for small firms. The coefficients for these variables are similar to those reported in Table 6. The new variable we want to focus on is the interaction between the small-firm dummy and financial globalization. This interaction is not significant and the coefficient is small. We interpret this as evidence that the increase in financial globalization affects the likelihood of a global IPO equally for both small and large firms. In other words, there is no evidence that the

[16] As noted earlier, world financial globalization is de-meaned. For this sample, the difference between the average values of financial globalization in the 1990s and 2000s is 1.513 so we get $e^{(0.923 \times 1.513)}$, or a factor of 4.041.

[17] In the 1990s, the average value of world financial globalization (de-meaned) is −0.908. The coefficient of 1.784 on the interaction term implies that a one-standard deviation increase in anti-self-dealing (0.190) lowers the odds of a global IPO by a factor of 0.456, e.g., $e^{0.190 \times (-2.514 + 1.784 \times -0.908)}$. In the 2000s when de-meaned world financial globalization is 0.605, it implies that the odds of a global IPO are lower by a factor of 0.761, e.g., $e^{0.190 \times (-2.514 + 1.784 \times 0.605)}$.

Table 7
Firm size, financial globalization, and IPO types.

This table presents logit regressions where the dependent variable in Panel A equals one for global IPOs and zero for domestic IPOs. In Panel B, the dependent variable equals one for foreign IPOs and zero for international IPOs. IPO data are from SDC and include 18,122 IPOs (14,322 domestic IPOs and 3,800 global IPOs of which 1,454 are international IPOs and 2,346 are foreign IPOs) by non-U.S. firms from 52 countries that have data for GDP and country *q* for at least one year and have size data from 1990 to 2011. With the exception of the institutions variables and the small-firm dummy, all variables are lagged by one year. Variables are defined in Table A1. The *t*-statistics are adjusted for clustering by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Domestic vs. *global IPOs*						*Panel B: Foreign* vs. *international IPOs*					
	(1)	Common law (2)	Anti-self-dealing (3)	Disclosure (4)	Liability standards (5)	Rule of law (6)	(7)	Common law (8)	Anti-self-dealing (9)	Disclosure (10)	Liability standards (11)	Rule of law (12)
Constant	−0.358	−0.393**	−0.407*	−0.571**	−0.490*	−0.411**	0.507**	0.559***	0.560***	0.207	0.219	0.502**
	(−1.49)	(−1.99)	(−1.66)	(−2.06)	(−1.90)	(−2.07)	(2.52)	(2.68)	(2.95)	(1.05)	(1.22)	(2.52)
Institutions		−0.185	−1.524*	−3.107**	−2.196*	−0.206		0.862	2.160**	1.243	2.692***	−0.222
		(−0.35)	(−1.80)	(−2.12)	(−1.85)	(−0.52)		(1.49)	(2.39)	(0.86)	(4.04)	(−0.51)
Small-firm dummy	−1.691***	−1.651***	−1.636***	−1.608***	−1.728***	−1.635***	0.395	0.336	0.341	0.309	0.389	0.415*
	(−5.50)	(−5.34)	(−5.59)	(−5.02)	(−5.92)	(−5.69)	(1.55)	(1.37)	(1.38)	(1.38)	(1.57)	(1.75)
Small firm × globalization	0.224	0.212	0.215	0.158	0.159	0.199	0.750***	0.592***	0.621***	0.712***	0.649***	0.777***
	(0.63)	(0.59)	(0.62)	(0.40)	(0.40)	(0.57)	(3.00)	(2.84)	(2.74)	(3.39)	(2.96)	(3.42)
World financial globalization	0.795***	0.812***	0.802***	0.874***	0.981***	0.766**	1.332***	1.319***	1.359***	1.359***	1.342***	1.274***
	(3.01)	(3.41)	(2.97)	(3.45)	(3.90)	(2.48)	(6.42)	(5.98)	(6.20)	(5.47)	(5.45)	(5.01)
Country *q*	0.139	0.158	0.134	0.247	0.382	0.176	1.119**	1.237**	1.316***	0.932	1.012	1.167**
	(0.25)	(0.28)	(0.25)	(0.40)	(0.63)	(0.31)	(2.09)	(2.53)	(2.58)	(1.29)	(1.30)	(2.17)
World *q*	−0.156	−0.126	−0.656	−0.701	−0.767	−0.031	−1.617	−1.497	−0.962	−0.290	−0.260	−1.677
	(−0.18)	(−0.14)	(−0.66)	(−0.55)	(−0.69)	(−0.03)	(−0.82)	(−0.70)	(−0.48)	(−0.12)	(−0.10)	(−0.84)
GDP growth	0.024	0.019	0.051	0.006	0.004	0.015	0.133***	0.128**	0.087*	0.042	0.023	0.134***
	(0.58)	(0.43)	(1.05)	(0.08)	(0.06)	(0.34)	(2.62)	(2.32)	(1.86)	(0.82)	(0.42)	(2.68)
Market cap/GDP	0.120	0.175	0.337	0.447*	0.329	0.151	−0.388***	−0.556***	−0.644***	−0.421***	−0.510***	−0.366***
	(0.43)	(0.59)	(1.22)	(1.66)	(1.40)	(0.56)	(−4.89)	(−3.56)	(−3.97)	(−2.72)	(−4.39)	(−4.06)
Market turnover	−0.537**	−0.591***	−0.567**	−0.633*	−0.713**	−0.564**	0.001	0.168	0.053	−0.241	−0.099	0.006
	(−2.18)	(−2.79)	(−2.27)	(−1.96)	(−2.23)	(−2.48)	(0.00)	(0.59)	(0.18)	(−0.63)	(−0.27)	(0.02)
Log (GDP/capita)	0.184	0.167	0.175	0.111	0.209	0.271	0.124	0.123	0.169	0.315**	0.325***	0.255
	(1.17)	(1.09)	(1.21)	(0.69)	(1.49)	(1.14)	(0.69)	(0.55)	(1.01)	(2.36)	(3.22)	(0.90)
Number of observations	18,122	18,122	18,122	15,946	15,946	18,122	3,800	3,800	3,800	3,089	3,089	3,800
Pseudo R^2	0.1731	0.1738	0.1817	0.2194	0.2249	0.1739	0.2886	0.3026	0.3089	0.2535	0.3009	0.2894

increase in financial globalization benefitted large-firm IPOs more than small-firm IPOs. We then add the institutional variables in models (2) to (6). For each institutions variable, the regression coefficient is negative, so that a firm is less likely to have a global IPO if institutions are better in its country. However, as in Table 6, the coefficients for common law and rule of law are not significant. Adding the institutions variables does not change our inferences concerning the role of size or financial globalization. Finally, it is useful to note that the regressions using disclosure and liability standards do not include China because we do not have these variables for China. Consequently, our results are not sensitive to including China in the sample.

If a firm chooses to have a global IPO, it has a choice between an international IPO and a foreign IPO. We now examine the determinants of that choice and, in particular, whether firm size plays a role in that choice. In Panel B of Table 7, we estimate logit regression models where the dependent variable takes a value of one if a global IPO is a foreign IPO (2,346 observations) and zero if it is an international IPO (1,454 observations). Simple country-level averages in Table 5 indicated that small-firm global IPOs are more likely to be foreign IPOs than international IPOs which can include a domestic and foreign tranche.

Because the theoretical literature has not focused on the distinction between foreign and international IPOs, we cannot offer predictions from this literature. We argued earlier that a global IPO has higher fixed costs than a domestic IPO. However, with a foreign IPO, the firm is constrained by the demand for its shares in the foreign country while, with an international IPO, it has the option of being able to sell more shares at home if the foreign demand is low. As financial globalization increases, we would expect that there would be less risk that foreign investors shun an IPO from a firm that is not located in their country as the home bias decreases generally. Hence, we would predict that financial globalization would make foreign IPOs more attractive for small firms since such IPOs are more cost advantageous for them and since they become less risky with financial globalization. In any case, it is important to control for the possibility that it is not the small-firm characteristic that is associated with foreign IPOs, but rather that small-firm global IPOs may be concentrated in countries with certain attributes. We, therefore, control for the country characteristics we controlled for before as well as for the quality of institutions.

In models (7) through (12) of Table 7, we consistently find that financial globalization is associated with a greater likelihood that a global IPO is a foreign IPO. Small firms are not more likely to have a foreign IPO than large firms, but the positive and significant coefficient on the interaction between the small-firm dummy and financial globalization implies that financial globalization made it more likely that small firms pursue a foreign IPO. For example, from model (9), we see that in the 1990s, when globalization is lower, the odds of a foreign IPO by small firms are 32.0% lower than the odds for large firms. In the 2000s, when globalization is higher, the odds of a foreign IPO by small firms are 1.704 times the odds for large firms, or 70.4% higher.[18]

We also find that firms in countries with a higher country q are more likely to pursue foreign IPOs and firms from countries with higher market capitalization are less likely to consider foreign IPOs. Though we estimate regressions with institutions variables, we have no theoretical predictions for the coefficients. We find that firms from countries with a higher anti-self-dealing index and higher liability standards are more likely to have foreign IPOs. As in Panel A, our results are not sensitive to whether China is in the sample.

7. Has financial globalization left the U.S. IPO market behind?

In this section, we investigate whether the U.S. has too few IPOs compared to other countries controlling for country characteristics and examine whether financial globalization has led to an increase in IPO activity outside the U.S. relative to the U.S. In other words, we ask: are there missing IPOs in the U.S.? And does financial globalization play a role in explaining the low U.S. share of worldwide IPO activity?

Before answering this two-part question, it is useful to use the data on small- and large-firm IPOs to understand whether the U.S. share of world IPOs evolved differently for small and large firms. In Section 3, we showed the evolution of the share of U.S. IPOs relative to world IPOs separating domestic and global IPOs. Using our size threshold, we can now look separately at the share of U.S. IPOs for small firms and for large firms. Since proceeds are related to size, we focus more on IPO counts because the interpretation is more straightforward. Panel A of Fig. 3 shows the results for counts. The contrast between small- and large-firm IPOs is noteworthy. While substantial in the 1990s, the U.S. share of small-firm IPOs falls by 83% from the 1990s to the 2000s, and virtually disappears in the 2000s, averaging about 5% per year. The U.S. share of large-firm IPOs also falls from 60% in the 1990s to 28% in the 2000s, but the peak in the 2000s is not drastically different from the lowest value in the 1990s. The U.S. share of large-firm IPOs is five times the U.S. share of small-firm IPOs in the 2000s. The results for proceeds, in Panel B of Fig. 3, are even more striking for small-firm IPOs, dropping from a dominating percentage in 1990–1992 to virtually nothing between 2005 and 2009. One notable difference in the panels is the U.S. share of large-firm IPO proceeds in 2008, where the impact of the huge Visa IPO is highly visible.

The dramatic drop in the share of small-firm IPOs by U.S. firms raises the question of whether this drop is due to changes in the U.S. only or whether it can be partly explained by the increase in financial globalization. To answer this question, in Table 8, we estimate regressions that predict a country's total IPO rate. Note that the

[18] In the 1990s, the average value of world financial globalization (de-meaned) is -1.169 in this sample. The odds of a foreign IPO by a small firm are $e^{(0.341+0.621\times-1.169)}$, or 0.680 times the odds for a large firm. In the 2000s, the odds of a foreign IPO by a small firm are $e^{(0.341+0.621\times0.309)}$, or 1.704 times that for a large firm.

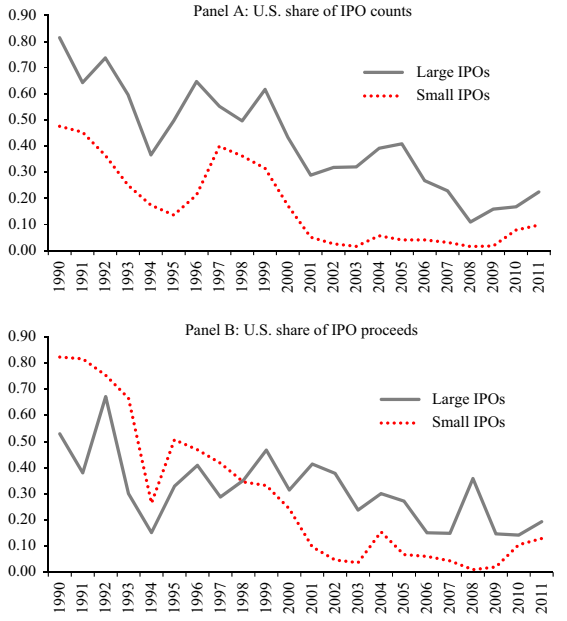

Fig. 3. The U.S. share of small- and large-firm world IPO activity. This figure shows annual share of total IPO activity for small and large U.S. firms relative to firms in the rest of the world from 1990 to 2011. IPO data are from SDC and include 18,827 domestic and 4,761 global IPOs that have size data from 53 countries. Each year, firms going public are classified as small vs. large. See Table A1 for details. Panel A shows the number of small (large) U.S. IPOs scaled by the number of small (large) IPOs by firms from around the world. Panel B shows IPO proceeds raised by small (large) U.S. firms scaled by IPO proceeds raised by small (large) firms from around the world. Proceeds and GDP are in constant 2007 U.S. dollars (millions).

dependent variables include both global and domestic IPO counts and proceeds. These regressions are designed to help understand whether there is a differential effect of financial globalization on total IPO activity in non-U.S. countries compared to the U.S. and whether this effect differs according to firm size. We use the same independent variables as in Table 4, but with two differences. First, we exclude the institutions variables. Our conclusions hold if we include these variables, but our focus here is on the relation between financial globalization and the total IPO rate. Second, we include a dummy variable that equals one for non-U.S. countries and zero for the U.S. ("Non-U.S. dummy") as well as an interaction of the non-U.S. dummy variable with the financial globalization variable ("Non-U.S. dummy × globalization"). We de-mean financial globalization to facilitate interpretation of the coefficients.

We first discuss the results for counts in Panel A of Table 8. The dependent variable is a country's total number of IPOs in a year divided by the number of listed firms at the end of the previous year. Model (1) has the same explanatory variables as model (1) of Table 4 but reports results for the IPO sample that has size data available and the dependent variable is a country's total IPO rate instead of its domestic IPO rate. Requiring size data eliminates 130 country-year observations. The non-U.S. dummy is insignificant, but the interaction of that variable with financial globalization is positive and significant at the 1% level, which in effect offsets the negative coefficient on financial globalization that applies for total U.S. IPO activity. To put these estimates in perspective, it is helpful to note that if we split our sample period into the 1990s and 2000s, the raw IPO counts are higher in non-U.S. countries in the 2000s than in the 1990s but they plummet in the U.S. over that same horizon. In the first half of the sample when financial globalization is low, there are 0.37 U.S. IPOs for each non-U.S. IPO, while in the second half of the sample, there are only 0.12 U.S. IPOs for each non-U.S. IPO.

Another way to quantify the magnitude of the globalization effect is to estimate how many fewer non-U.S. IPOs would have taken place in the 2000s had financial globalization not grown as dramatically as it did. Using the average value of financial globalization in the 2000s and holding all other variables at their unconditional means in model (1), the fitted value for the annual rate of non-U.S. IPO activity is 2.29%, which represents 804.6 IPOs per year relative to the 34,992 listed companies outside the U.S. in the 2000s. If we suppress the positive coefficient for the interaction of the non-U.S. dummy and financial globalization, the fitted value for annual non-U.S. IPO activity is 1.32%, or 461.4 IPOs per year. That is, each year during the 2000s, about 343 non-U.S. IPOs would not have happened without globalization.

Before proceeding, we note three caveats with these results. First, the regression shows that the increase in financial globalization is associated with a wedge between the IPO rate of non-U.S. countries and that of the U.S. However, it does not establish causality. We cannot reject the fact that the increase in financial globalization could be correlated with other forces that may have played a role in the creation of this wedge. However, our earlier results provide support for a number of hypotheses related to the impact of financial globalization and model (1) is consistent with them. Second, the wedge between IPO activity in the rest of the world and the U.S. results from the U.S. IPO rate falling with financial globalization while the non-U.S. IPO rate does not fall. The existence of the wedge is consistent with our predictions, but the fact that the wedge arises because of a drop in U.S. IPOs rather than because of an increase in non-U.S. IPOs still remains to be explained. Finally, to the extent that financial globalization leads to higher real economic growth and valuations, it can also lead to a higher IPO rate indirectly. And, even if financial globalization is associated with more and larger IPOs, a country could still have a lower IPO rate if the number of listed firms (used in the denominator to compute the IPO rate for counts) increased at a faster pace. Thus our regression might underestimate the potential effect of financial globalization.

We next turn to the regression for small-firm IPOs only in model (2) of Panel A of Table 8. The dependent variable for counts is the number of small-firm IPOs in a country-year divided by the number of listed firms at the end of the previous year. As in model (1), the interaction between the non-U.S. indicator variable and financial globalization is positive and significant at the 1% level. Although in model (1) the non-U.S. indicator variable is not significant, it is positive and significant for small firms in model (2). This result is surprising because it means that, unconditionally, non-U.S. countries have a more active IPO market for small firms than the U.S. Further, this advantage expands with

Table 8
Financial globalization and the evolution of non-U.S. IPO activity.

The dependent variable is each country's annual measure of total (domestic and global) IPO activity. IPO data are from SDC and include 32,582 IPOs (26,299 domestic and 6,283 global IPOs) from 53 countries that have data for GDP and country q for at least one year during the sample period from 1990 to 2011. For each country, total IPO counts and proceeds are summed annually. Each year, firms going public are classified as small vs. large. Panel A shows regressions where the dependent variable is total IPO counts scaled by the lagged number of domestic firms. Panel B shows regressions where the dependent variable is total IPO proceeds (winsorized at the top 5%) scaled by lagged GDP. Both measures of IPO activity are multiplied by 100. The count measure is winsorized at the 1st and 99th percentiles. Country-years with no data for the number of domestic firms or GDP are excluded. All time-varying variables are lagged by one year. Variables are defined in Table A1. The t-statistics are adjusted for clustering by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: IPO counts			*Panel B: IPO proceeds*		
	Sample with size data (1)	Small IPOs (2)	Large IPOs (3)	Sample with size data (4)	Small IPOs (5)	Large IPOs (6)
Constant	−1.437	−1.242	0.840	0.035	−0.069	0.113
	(−0.78)	(−0.71)	(0.61)	(0.30)	(−1.64)	(1.03)
Non-U.S. dummy	−0.187	1.377**	−0.679***	0.036	0.047***	0.010
	(−0.45)	(2.56)	(−3.20)	(1.42)	(4.04)	(0.51)
Non-U.S. × globalization	1.786***	1.359***	0.505***	0.079***	0.028***	0.050***
	(4.75)	(3.15)	(2.88)	(5.21)	(3.03)	(5.02)
World financial globalization	−1.876***	−1.656***	−0.737***	−0.066***	−0.028***	−0.033***
	(−4.67)	(−3.02)	(−2.76)	(−4.68)	(−3.30)	(−2.70)
Country q	1.388	0.985	0.694**	0.020	0.018	−0.004
	(1.64)	(1.24)	(2.17)	(0.52)	(1.11)	(−0.15)
GDP growth	0.133*	0.139**	0.077	0.009***	0.004***	0.008***
	(1.76)	(2.02)	(1.24)	(3.42)	(3.66)	(3.09)
Market cap/GDP	0.106	0.157	−0.156	0.170***	0.043***	0.141***
	(0.43)	(0.79)	(−1.07)	(3.45)	(3.57)	(3.72)
Market turnover	0.597	0.968	0.317	−0.020	0.006	−0.033**
	(1.18)	(1.45)	(0.87)	(−1.30)	(0.76)	(−2.30)
Log (GDP/capita)	0.136	−0.078	−0.044	−0.007	0.001	−0.009
	(0.53)	(−0.29)	(−0.24)	(−0.68)	(0.21)	(−0.97)
Number of observations	966	802	860	966	802	860
Adjusted R^2	0.0500	0.0593	0.0345	0.1637	0.1119	0.1505

financial globalization. When we turn to large-firm IPOs in model (3), we see that non-U.S. countries have a distinctly lower count, on average, of large-firm IPOs (significant negative coefficient of −0.679 on the non-U.S. dummy), but that low count abates as financial globalization increases. It is important to note, however, that the coefficient on the interaction of financial globalization with the non-U.S. indicator variable is much larger for small-firm IPOs. With these results, it is not surprising that Panel A of Fig. 3 shows a dramatic decrease in the U.S. share of world IPOs for small firms. In fact, when we regress the U.S. share of small-firm IPO counts on just financial globalization, it has a coefficient of −0.128 and is significant at the 1% level. A change in the competitive position of small firms across the world, per the economies of scope hypothesis discussed in Gao, Ritter, and Zhu (2012), is not sufficient to explain the lack of small-firm IPOs in the U.S. since the number of IPOs by small non-U.S. firms held steady while IPOs by small U.S. firms declined dramatically.

Models (4)–(6) repeat the first three regressions, but for proceeds. The dependent variable is total proceeds divided by the country's GDP in the previous year. Since proceeds are related to size, such a split does not seem appropriate for proceeds regressions. Nonetheless, inferences are similar to those for counts, except that the coefficient on the non-U.S. dummy for large firms is positive and insignificant in model (6) compared to model (3) where it is negative and significant.

8. Why did the U.S. experience an abnormally large decline in small-firm IPOs?

We showed that U.S. IPO activity, especially by small firms, did not benefit from financial globalization, so that the share of U.S. IPOs in worldwide IPO activity fell. In this section, we use our regressions to understand which U.S.-specific factors help explain the abnormally low U.S. IPO activity by small firms in the 2000s. We already discussed the economies of scope hypothesis of Gao, Ritter, and Zhu (2012). This hypothesis predicts fewer small-firm IPOs, but it does not predict that the reduction in small-firm IPOs should be particularly acute for the U.S. In the years leading up to the passage of the JOBS Act in 2012, a number of explanations were put forward (e.g., Pinelli and Muscat, 2007; Weild and Kim, 2010; Ernst and Young, 2009; the IPO Task Force Report to the U.S. Treasury, 2011).[19] These explanations include excessively high costs for lawyers, accountants, and offering expenses, insufficient liquidity in smaller offerings for institutional investors as primary buyers of IPOs, the absence of a market infrastructure to support smaller IPOs such as specialized investment banks and analyst following, and reduced equity market confidence in the aftermath of the Internet market decline of 2000 and the Enron/WorldCom scandals

[19] See Coffee (2011) and Ritter (2013) for a more complete discussion.

of 2001-2002. Key events tied to these explanations highlighted in Weild and Kim (2010) include the launch of the first online brokerage accounts (1996), new National Association of Securities Dealers (NASD) order-handling rules (1996), the passage of the Gramm-Leach-Bliley Act (1999) which repealed the 1933 Glass-Steagall Act and facilitated the acquisition of several specialty investment banks for small-firm IPOs, the passage of Regulation Fair Disclosure (2000), the launch of decimalization (2001), the Sarbanes-Oxley Act (2002), the 2003 Global Settlement ruling restricting conflicts of interest between equity research and investment banking, and Regulation National Market System (Securities and Exchange Commission, 2005). In addition, financial globalization could have led to a reallocation of scarce resources towards global deals.

As Coffee (2011) and Weild and Kim (2010) point out, access to private markets became easier at the same time that access to public markets became more onerous. The Securities and Exchange Commission (SEC) relaxed Rule 144 holding-period rules for restricted securities in 1997. Further, viable trading platforms had become available for 144a and Regulation D (exempted) securities, most notably the Nasdaq Portal Alliance.

A comprehensive analysis of these competing U.S.-specific explanations lies beyond the scope of our paper. However, we can use our worldwide sample of domestic and global IPOs to investigate when U.S. IPO rates became abnormally low compared to the rest of the world. If, as many argue, the adoption of SOX played a major role in the decrease in small-firm IPO activity in the U.S., we should see IPO activity by small U.S. firms fall significantly relative to the rest of the world after the adoption of SOX. To determine when U.S. IPO activity became abnormally low, we conduct three different experiments.

We first re-estimate the six models in Table 8, except that we replace the financial globalization proxy with year indicator variables (1991 through 2011) and further allow these to interact with the non-U.S. dummy variable. Because of the issues we mentioned earlier concerning regressions using proceeds, we focus on the count regressions in our discussion. With this specification, the indicator variable for a given year should be significantly negative if U.S. IPO activity is abnormally low compared to the rest of the world. Rather than reproducing the regression estimates in a table, we plot the coefficient estimates of the yearly indicator variables in Fig. 4. We find that, for the sample as a whole, the coefficients are positive until 2000 and significant except in 1998. After 2000, the coefficients are negative and significant every year until 2004 when they are again positive and significant. The coefficients are insignificant in all subsequent years except for 2008 and 2009 when they are negative and significant. It follows from these results for the whole sample that the IPO rate in the U.S. is abnormally low starting before the adoption of SOX and is not abnormally low for the years 2004–2007.

We now turn to the count regression for small firms. With that regression, the results are sharply different from those for the sample as a whole. The yearly indicator variable coefficients are significantly positive until 1997. They are then insignificant each year through 2000. From 2001 until at least up to 2010, the coefficients are significantly negative each year. It follows that the U.S. IPO rate for small firms is abnormally low from 2001 to 2009.[20] Since we saw that the IPO rate for the sample as a whole is abnormally low during the 2000s for less than half of the years, it is not surprising that the IPO rate for large firms is not abnormally low during the 2000s. To be precise, the indicator variable coefficient is insignificant from 2001 to 2003. After 2003, it is positive and significant until 2008 when it is negative and significant. Finally, it is insignificant in 2009–2010 before turning negative and significant in 2011.

Fig. 4 shows that the IPO rate in the U.S. is abnormally low mostly for small firms during the 2000s and that it turns abnormally low in 2001, which was before the adoption of SOX. Though we do not tabulate results for the proceeds regressions, the results are largely similar to the results that we find for counts. Hence, our regression results make it possible to reject the hypothesis that small-firm IPO activity in the U.S. became abnormally low as a result of the adoption of SOX.

We next present two formal tests (but do not tabulate them) to assess whether there is a structural break in the IPO rate for U.S. firms. We first use a Chow (1960) structural break test in which we allow the coefficients in the panel regression model to shift around a pre-specified breakpoint year. An *F*-statistic evaluates the null hypothesis of no break across all parameters in the model. Using our panel regression models in Table 8 (excluding the financial globalization variable), we are able to reject the null hypothesis at the 1% level for all, small-firm only, and large-firm only IPOs for counts and proceeds each year from 1996 through 2001. For structural breaks around 2002 through 2004, we are still able to reject the null but for large-firm IPO counts. In almost all of these specifications, the patterns are the same: significantly negative coefficients on the post-break dummy variable alone (which represents the U.S.) and significantly positive coefficients on the interaction of the post-break dummy variable with the non-U.S. dummy variable. The effects are stronger for small-firm IPO counts and proceeds and they become less reliable for structural breaks after 2002. This confirms our earlier suspicion that structural shifts in U.S. IPO activity relative to the rest of the world took place before 2002.

The second econometric test allows for parameter instability and structural change, but with multiple structural changes possible and with unknown change points; it is based on Bai and Perron (1998, 2002). Sequential estimation procedures allow consideration of one break candidate at a time and then multiple breaks by a search algorithm that minimizes the sum of squared residuals. We are only able to investigate the Bai-Perron procedure for the U.S. IPO activity series alone and we do so in three ways: (a) using a simple model with a constant; (b) using a linear model with the same explanatory variables as in Table 8 (excluding the financial globalization variable);

[20] We do not show the year indicator variable coefficients for non-U.S. small-firm IPOs in Fig. 4. The coefficients are close to zero in the 1990s and then become large, positive, and statistically significant in the 2000s. This is consistent with the results in Table 8 that show non-U.S. IPO activity for small firms is "abnormally" positive over the entire period and increases significantly with greater financial globalization.

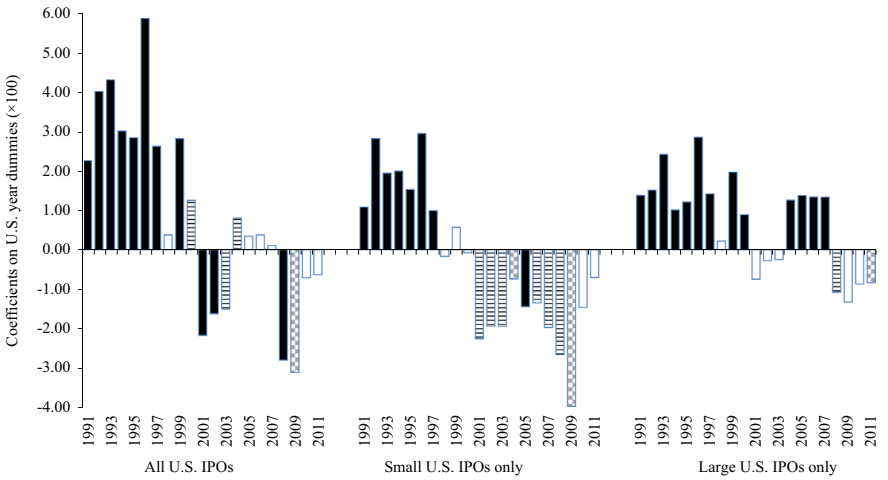

Fig. 4. Abnormal U.S. IPO activity by year. This figure shows the coefficients (multiplied by 100) on year indicator variables added to the models in Table 8 where the dependent variable is total IPO counts scaled by the lagged number of domestic firms. The year indicator variables are added for the U.S. only and for non-U.S. countries as a whole and the world financial globalization variable is dropped from the models. The total IPOs count measure is winsorized at the 1st and 99th percentiles. Country-years with no data for the number of domestic firms or GDP are excluded. All time-varying variables are lagged by one year. Variables are defined in Table A1. A black bar indicates that the coefficient is statistically significant at the 1% level, a bar with horizontal lines, at the 5% level, a bar with squares, at the 10% level, and a white bar, statistically insignificant.

and (c) using a simple model with a constant, but for the residuals from the panel regression models of Table 8. Similar results obtain for all three approaches. Two breaks are almost always identified yielding the lowest sum of squared residuals. The first is always near the beginning of the sample around 1991 and the second breakpoint year arises around 1999 or 2000. If we impose only one breakpoint, it is always the latter one identified. For counts or proceeds, the key breakpoint year is 2000 for all IPOs and small-firm IPOs, but as late as 2007 for large-firm IPOs.

From this analysis, one is more likely to dismiss explanations of the decline in U.S. small-firm IPOs based on regulatory events, such as SOX, Regulation NMS, or the Global Settlement in favor of those related to decreased liquidity in small stocks that started in the 1990s. This finding provides a formal basis using a global benchmark for the conclusion in Weild and Kim (2010) and Gao, Ritter, and Zhu (2012) that the decrease in small-firm IPOs in the U.S. cannot be explained by the U.S. regulatory events in the 2000s.

One final experiment we conduct is to ask whether our inferences about the decline in U.S. small-firm IPO activity are affected when we account for the potentially less costly, less burdensome process of raising capital in the private markets or via alternative sources. Instead of going public, private firms could be acquired so that they can invest more or so that insiders could cash out. Engel, Hayes, and Wang (2007) show that the frequency of going-private transactions increased significantly after SOX and the abnormal returns surrounding the going-private decision were related to various proxies of the net benefits of being a public firm. Alternatively, firms could use debt instead of equity financing to fund their needs. To test these ideas, we estimate the regressions of Table 8 including, as above, year dummies and interactions of those with the non-U.S. dummy, but now add two country-specific proxies for private market financing. The first proxy, from SDC, counts the number of acquisitions of private firms in the country in the preceding year scaled by the number of listed domestic firms. The second proxy for the level of private credit available, computes deposits taken by money-center banks and other financial institutions as a fraction of GDP in the preceding year, obtained from the original and updated versions of the Financial and Structure database in Beck, Demirgüç-Kunt, and Levine (2000). In untabulated results, we find that adding private acquisitions is rarely significant; it is so only for the large-firm IPO counts and with a positive coefficient, which seems to go against our expectations of a substitute financing mechanism. Private credit is also insignificant, except for small-firm IPO counts, again with the surprising positive sign. The coefficients on the year dummies indicate the same declining pattern for U.S. IPO activity, which implies that the viability of private markets is unlikely to explain the phenomenon.

9. Robustness tests

There are several potential concerns with our sample of IPOs, the institutions variables we use, the regression tests, and our inferences from those tests. We performed a number of robustness checks to assess the magnitude of those concerns, focusing mainly on regressions that use the anti-self-dealing index as the proxy for national institutions. In Table 9, we report the results from a number of key checks for Tables 4 and 6. Panels A and B show results for domestic IPO counts and proceeds (paralleling tests in Table 4), while Panel C shows results for the choice to have a global versus domestic IPO (paralleling tests in Table 6). We also discuss, but do not report, findings from a number of additional tests for these tables, as well as for Tables 7 and 8.

Our tests use data from LMF to measure financial globalization. This measure is constructed from the total external assets and liabilities across our sample countries. As an alternate measure of globalization, we use the "KOF Index of Globalization," an index built by the KOF Swiss

Table 9
Robustness tests.

In Panels A and B the dependent variable is each country's annual measure of IPO activity. IPO data are from SDC and include 26,299 domestic IPOs from 53 countries that have data available for GDP and country q for at least one year during the sample period from 1990 to 2011. For each country, IPO counts and proceeds are summed annually. Panel A (Panel B) shows regressions where the dependent variable is domestic IPO counts scaled by the lagged number of domestic firms (domestic IPO proceeds, excluding proceeds in the domestic tranche of global IPOs, winsorized at the top 5%, and scaled by lagged GDP). Both measures of domestic IPO activity are multiplied by 100. The count measure is winsorized at the 1st and 99th percentiles. Country-years with no data for the number of domestic firms or GDP are excluded. Panel C shows logit regressions where the dependent variable equals one for global IPOs and zero for domestic IPOs. The sample includes 18,122 IPOs (14,322 domestic IPOs and 3,800 global IPOs) by non-U.S. firms from 52 countries. With the exception of the institutions variables and the small-firm dummy, all variables are lagged by one year. Variables are defined in Table A1. The t-statistics are adjusted for clustering by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Domestic IPO counts		*Panel B: Domestic IPO proceeds*			*Panel C: Global vs. domestic IPOs*		
	KOF globalization (1)	Tobit (2)	KOF globalization (3)	Proceeds not winsorized (4)	Tobit (5)	KOF globalization (6)	Double cluster SEs (7)	Exclude China (8)
Constant	0.218	−4.337	0.094	0.006	−0.105	−0.518**	−0.548**	−0.603**
	(0.13)	(−1.54)	(1.20)	(0.06)	(−0.86)	(−2.08)	(−2.09)	(−2.42)
Anti-self-dealing	4.180***	7.026***	0.217***	0.262***	0.353***	−1.912**	−2.154**	−2.639***
	(4.02)	(4.46)	(4.20)	(4.57)	(4.73)	(−2.09)	(−2.32)	(−2.67)
Anti-self-dealing × globalization	−0.504***	−2.581***	−0.047***	−0.205***	−0.212***	0.174**	1.784***	2.081***
	(−2.91)	(−3.22)	(−4.05)	(−3.57)	(−3.74)	(2.17)	(3.55)	(2.93)
World financial globalization	−0.253***	−1.249***	−0.012***	−0.056***	−0.055***	0.191***	1.036***	1.142***
	(−5.34)	(−5.29)	(−5.99)	(−5.55)	(−5.58)	(3.12)	(3.65)	(3.83)
Small-firm dummy						−1.483***	−1.548***	−1.662***
						(−6.86)	(−6.65)	(−6.91)
Country q	1.539**	2.161**	0.055	0.099**	0.083*	0.245	−0.003	0.284
	(2.14)	(1.99)	(1.66)	(2.16)	(1.70)	(0.44)	(−0.01)	(0.43)
Global q						−1.941	−0.530	−1.148
						(−1.64)	(−0.62)	(−0.97)
GDP growth	0.127**	0.180**	0.007***	0.009***	0.010***	0.065	0.046	0.021
	(2.65)	(2.49)	(3.17)	(3.23)	(3.16)	(1.32)	(0.88)	(0.32)
Market cap/GDP	−0.028	0.010	0.032*	0.027	0.038*	0.383	0.295	0.429*
	(−0.09)	(0.02)	(1.83)	(1.44)	(1.66)	(1.44)	(1.10)	(1.76)
Market turnover	1.220**	2.055***	0.043**	0.063**	0.081***	−0.237	−0.614***	−0.689**
	(2.60)	(3.67)	(2.52)	(2.53)	(3.32)	(−0.90)	(−3.02)	(−2.52)
Log (GDP/capita)	−0.116	0.042	−0.016**	−0.010	−0.011	0.182	0.167	0.206
	(−0.61)	(0.14)	(−2.03)	(−1.11)	(−0.91)	(1.27)	(1.07)	(1.58)
Number of observations	1,096	1,096	1,096	1,096	1,096	18,122	18,122	16,222
Adjusted R^2/ pseudo R^2	0.2150	0.0587	0.2862	0.2173	0.5033	0.1633	0.1898	0.2250

Economic Institute (www.globalization.kof.ethz.ch). It measures economic as well as social and political dimensions of globalization and is available for a large number of countries over our sample period. We focus on the economic globalization sub-index, which gives 50% weight to actual flows (trade, foreign direct investment, portfolio investment, and income payments to foreigners) and 50% weight to restrictions (import barriers, tariffs, taxes on international trade, and capital account restrictions). As with the LMF financial globalization measure, we aggregate the country-level data to a world-level index. Models (1) and (3) in Panels A and B of Table 9, respectively, present the results for domestic IPO counts and proceeds, while model (6) in Panel C shows results for the choice to have a global versus domestic IPO. In all cases, the results are similar to those reported in Tables 4 and 6. We also check an alternate version of the LMF measure that uses only external *equity* assets and liabilities, thus excluding debt, derivatives, and currency reserves. Again, the findings are similar. Inferences in Tables 7 and 8 are also similar when we use these measures.

A second concern with our data is the potential distortions that arise from very large IPOs that generate large outliers in country-year IPO rates based on proceeds. As discussed in Section 4, we deal with this problem by winsorizing the proceeds of the largest 5% of IPOs. In model (4) of Panel B, we re-estimate the regression for domestic IPO proceeds without this constraint and use actual proceeds to compute IPO rates. Inferences are similar to those reported in Table 4.

One concern with our model specification for domestic IPOs in Table 4 is that the dependent variable, measured as a rate of IPO activity, is censored at zero. Potential demand for IPOs among firms that did not choose to go public is unobserved. Truncation, or censoring, can induce a form of omitted-variable bias when the regression is estimated by ordinary least squares. To evaluate the importance of this bias, we re-estimate the domestic IPO regressions using Tobit models. Models (2) and (5) in Panels A and B, respectively, of Table 9 show that the results are similar to those reported in Table 4. In particular, the coefficients on the anti-self-dealing index, the financial globalization

variable and their interaction, have the correct signs and are statistically significant. Tobit models for the total IPO analysis of Table 8 (not tabulated) lead to similar results and inferences.

Finally, in Panel C of Table 9, we report two further robustness checks. In model (7) we report logit regressions of the choice to have a global versus domestic IPO where the standard errors (SE) are clustered by both country and year. In model (8) we exclude China, which accounts for a large number of global IPOs, especially in recent year. In both cases, the results are similar to those reported in Table 6. We also find that inferences for Table 7 are similar (not tabulated).

In addition to the robustness checks reported in Table 9, we conduct a number of other tests that are not tabulated. These tests examine other institutions variables, different samples and subsamples by country (excluding Chinese offerings in Hong Kong) and by type of offering (excluding privatizations), as well as alternative model specifications. Our key inferences remain intact.

10. Conclusions

This paper documents dramatic changes in the IPO landscape around the world over the past two decades. U.S. IPOs have become less important and IPOs in other countries have become more important, whether one looks at counts or at proceeds. In fact, U.S. IPO activity has generally not kept pace with the economic importance of the U.S. and it is especially lagging in small-firm IPOs where its share of world IPOs has become almost trivial. We show that financial globalization plays a critical role in facilitating IPOs by non-U.S. firms.

Financial globalization makes it easier for firms to have global IPOs, which enables them to overcome the adverse effects of weaker institutions in their home country. Greater financial globalization also affects the monitoring of firms, as holdings by institutional investors grow throughout the world. With greater financial globalization, a country's local institutions are less important for the domestic IPO rate. In addition, greater financial globalization is associated with an increase in the rate of global IPO activity.

Global IPOs played a critical role in increasing the importance of IPOs by non-U.S. firms. Though firms in countries with weaker institutions are less likely to go public with a domestic IPO, they are more likely to go public with a global IPO. That is, global IPOs enable firms to overcome poor institutions in their country of origin. Perhaps as a result, the laws and institutions of a firm's country of origin have become significantly less important in affecting the rate and pace of IPO activity in a country. Of course, there are also other important drivers of domestic and global IPO activity.

Our paper leaves open some important issues. First, although we find clear evidence that institutions became less important in affecting a country's IPO activity, it could be that laws and regulations that we do not account for still affect IPO activity. Further work should, therefore, examine the impact of changes in laws that are not captured by our institutions proxy variables. Second, we do not investigate the mechanism through which financial globalization affects individual IPOs. Hence, we cannot exclude the possibility that other factors correlated with financial globalization might have played a role, although these factors would also have to contribute to the decreased importance of institutions associated with financial globalization, a result predicted by theory that we verify empirically. A detailed study of how firms going public in financially open countries actually make use of institutions and resources from other countries would help in understanding better the impact of financial globalization on IPO activity. Finally, though we show that neither the regulatory changes of the early 2000s nor a worldwide change in the competitiveness of small firms explain the abnormally low level of small-firm IPO activity in the U.S. in the 2000s, further work is required to provide an explanation. In particular, while our findings are consistent with the view that U.S. financial markets became less hospitable for young, small firms, direct tests of this view, while needed, are beyond the scope of our paper. What we do show is that the rest of the world has had a lot more IPOs due to greater financial globalization than it would have had without it and that U.S. IPO activity has not benefitted from financial globalization.

Appendix A

See Table A1.

Table A1
Variable definitions.

IPO data are from SDC's Global New Issues database. IPO proceeds are in constant 2007 U.S. dollars. Country-level variables are from the World Bank's WDI database, La Porta, Lopez-de-Silanes, and Shleifer (2006), Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008), the World Bank's World Governance Indicators database, and the 2012 update of the Financial Development and Structure database, originally used in Beck, Demirgüç-Kunt, and Levine (2000). Data to compute Tobin's q are from Worldscope.

Variable	Definition
Anti-self-dealing	Average of ex ante and ex post private control of self-dealing, where ex ante is the average of approval by disinterested shareholders and ex ante disclosure; ex post is the average of disclosure in periodic filings and ease of proving wrongdoing. Ranges from zero to one. *Source*: DLLS (2008)
Common law	Equals one if a country's origin of commercial law is English common law, and zero otherwise. *Source*: DLLS (2008)
Country q	For each firm in country j, q is computed annually as total assets less the book value of equity plus the market value of equity all divided by book value of total assets (all variables in local currency). For each country, median industry qs are computed annually using the Fama-French 17-industry classification scheme. The industry qs are then weighted by their relative market values each year so that country q is the market value-weighted average of the median industry qs. *Source*: Worldscope
Disclosure	Arithmetic mean of (1) prospectus; (2) compensation; (3) shareholders; (4) inside ownership; (5) contracts irregular; and (6) transactions. Ranges from zero to one. *Source*: LLS (2006)
Domestic IPO counts/lagged # of domestic firms	Number of domestic IPOs in country j in year t divided by number of domestic listed firms in country j in year $t-1$ and is multiplied by 100. *Source*: SDC and WDI database
Domestic IPO proceeds/lagged GDP	Proceeds raised in domestic IPOs in country j in year t divided by GDP for country j in year $t-1$ and is multiplied by 100. Domestic IPO proceeds do not include proceeds from the domestic tranche of global IPOs. *Source*: SDC and WDI databases
GDP growth	Annual GDP growth. *Source*: WDI database
Log (GDP/capita)	Gross domestic product divided by midyear population. GDP is in current U.S. dollars. *Source*: WDI database
Market cap/GDP	Value of listed shares to GDP. Source: Financial Development and Structure database
Liability standards	Arithmetic mean of (1) liability standard for the issuer and its directors; (2) liability standard for distributors; and (3) liability standard for accountants. Ranges from zero to one. *Source*: LLS (2006)
Market turnover	Ratio of the value of total shares traded to average real market capitalization. *Source*: Financial Development and Structure database
Non-U.S. dummy	Equals zero for the United States and one for all other countries
Rule of law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Ranges from -1.6753 to 2.0431. *Source*: 2009 update of the Worldwide Governance Indicators database
Small-firm dummy	Each year, we compute the mean values of total assets and market capitalization of U.S. firms in Compustat with sales between \$45m and \$55m (in 2007 dollars). We use these values as cutoffs to define firms going public as small or large based on their pre-IPO total assets or market capitalization (IPO offer price $\times$ shares outstanding after the offer). If a firm going public is below the cutoff for total assets or for market capitalization in a given year, it is defined as small. Otherwise, it is defined as large. Source: Compustat and SDC
Total IPO counts/lagged # of domestic firms	Total number of IPOs (domestic and global) in country j in year t divided by number of domestic listed firms in country j in year $t-1$ and is multiplied by 100. *Source*: SDC and WDI database
Total IPO proceeds/lagged GDP	Total proceeds raised in IPOs (domestic and global) in country j in year t divided by GDP for country j in year $t-1$ and is multiplied by 100. *Source*: SDC and WDI database
World financial globalization	Each year, the U.S. dollar-denominated value of external assets and liabilities is summed across countries and divided by world GDP (in U.S. dollars). Source: updated and extended data set compiled by Lane and Milesi-Ferretti (2007)
World q	For each firm in country j, q is computed annually as total assets less the book value of equity plus the market value of equity all divided by book value of total assets (all variables in local currency). World median industry qs are computed across all firms worldwide using the Fama-French 17-industry classification scheme. To compute world q, each world industry q is weighted by the industry's relative market value (in USD). *Source*: Worldscope

References

Aggarwal, R., Erel, I., Ferreira, M., Matos, P., 2011. Does governance travel around the world? Evidence from institutional investors. Journal of Financial Economics 100, 154–181.

Ai, C., Norton, E., 2003. Interaction terms in logit and probit models. Economics Letters 80, 123–129.

Bai, J., Perron, P., 1998. Estimating and testing linear models with multiple structural changes. Econometrica 66, 47–78.

Bai, J., Perron, P., 2002. Computation and analysis of multiple structural change models. Journal of Applied Econometrics 18, 1–22.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2000. A new database on financial development and structure. World Bank Economic Review 14, 597–605.

Bekaert, G., Harvey, C., Lundblad, C., Siegel, S., 2007. Global growth opportunities and market integration. Journal of Finance 62, 1081–1137.

Black, B., Gilson, R., 1998. Venture capital and the structure of capital markets: banks versus stock markets. Journal of Financial Economics, 47; 243–277.

Borio, C., Disyatat, P., 2011. Global imbalances and the financial crisis: link or no link? Unpublished working paper. Bank for International Settlements.

Buis, M., 2010. Stata tip 87: interpretation of interactions in non-linear models. The Stata Journal 10, 305–308.

Caglio, C., Hanley, K., Marietta-Westberg, J., 2012. Going public abroad: The role of international markets for IPOs. Unpublished working paper. Federal Reserve Board of Governors and Securities and Exchange Commission.

Chow, G., 1960. Tests of equality between sets of coefficients in two linear regressions. Econometrica 52, 211–222.

Coffee, J., 1999. The future as history: the prospects for global convergence in corporate governance and its implications. Northwestern University Law Review 93, 641–708.

Coffee, J., 2001. The rise of dispersed ownership: the role of law in the separation of ownership and control. Yale Law Journal 111, 1–82.

Coffee, J., 2011. Testimony before the Senate Committee on Banking. Housing, and Urban Affairs, Washington, D.C. (December 1, 2011).

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2008. The law and economics of self-dealing. Journal of Financial Economics 88, 430–465.
Doidge, C., Karolyi, G.A., Stulz, R., 2007. Why do countries matter so much for corporate governance? Journal of Financial Economics 86, 1–39.
Engel, E., Hayes, R., Wang, X., 2007. The Sarbanes-Oxley Act and firms' going-private decisions. Journal of Accounting and Economics 44, 116–145.
Ernst and Young, 2009. Shifting landscape – are you ready? Global IPO trends report 2009. Ernst & Young Global Limited.
Gao, X., Ritter, J., Zhu, Z., 2012. Where have all the IPOs gone? Unpublished working paper. University of Hong Kong, University of Florida, and Chinese University of Hong Kong.
Greene, W., 2010. Testing hypotheses about interaction terms in nonlinear models. Economics Letters 107, 291–296.
Henderson, B., Jegadeesh, N., Weisbach, M., 2006. World markets for raising new capital. Journal of Financial Economics 82, 63–101.
IPO Task Force to the U.S. Treasury, 2011. Rebuilding the IPO On-Ramp: Putting Emerging Companies and the Job Market Bank on the Road to Growth. Available at National Venture Capital Association Web site, ⟨http://nvcatoday.nvca.org⟩.
Kang, J., Stulz, R., 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. Journal of Financial Economics 46, 3–28.
Karolyi, G.A., 2012. Corporate governance, agency problems and international cross-listings: a defense of the bonding hypothesis. Emerging Markets Review 13, 516–547.
Kaufmann, D., Kraay, A., Mastruzzi, M., 2010. The worldwide governance indicators: methodology and analytical issues. Unpublished World Bank Policy Research working paper no. 5430.
Kim, W., Weisbach, M., 2008. Motivations for public equity offers: an international perspective. Journal of Financial Economics 87, 281–307.
Kolasinski, A., Siegel, S., 2010. On the economic meaning of interaction term coefficients in non-linear binary response regression models. Unpublished working paper. Texas A&M University and University of Washington.
Kose, A., Prasad, E., Rogoff, K., Wei, S., 2009. Financial globalization and economic policies. CEPR Discussion Papers 7117.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1997. Legal determinants of external finance. Journal of Finance 52, 1131–1150.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and finance. Journal of Political Economy 106, 1113–1155.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2006. What works in securities laws? Journal of Finance 61, 1–32.
Lane, P., Milesi-Ferretti, G., 2007. The external wealth of nations mark II: revised and extended estimates of foreign assets and liabilities, 1970–2004. Journal of International Economics 73, 223–250.
Loughran, T., Ritter, J., 1995. The new issues puzzle. Journal of Finance 50, 23–51.
Lowry, M., 2003. Why does IPO volume fluctuate so much? Journal of Financial Economics 67, 3–40.
Ozer-Balli, H., Sorensen, B., 2013. Interaction effects in econometrics. Empirical Economics 45, 583–603.
Megginson, W., Smart, S., 2009. Introduction to Corporate Finance, second ed. Cengage Learning Inc., Florence, Kentucky.
Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An empirical analysis. Journal of Finance 53, 27–64.
Pinelli, M., Muscat, J., 2007. Global capital market trends. Ernst & Young LLP.
Ritter, J., Welch, I., 2002. A review of IPO activity, pricing, and allocations. Journal of Finance 57, 1795–1828.
Ritter, J., 2003. Investment banking and security issuance. In: Constantinides, G.M., Harris, M., Stulz, R.M. (Eds.), Handbook of the Economics of Finance, vol. 1A. , Elsevier North Holland, Amsterdam, pp. 255–306.
Ritter, J., 2013. Reenergizing the IPO market. In: Bailey, M., Herring, R. (Eds.), Restructuring to Speed Economic Recovery, Brookings Institution Press, Washington, DC. (forthcoming).
Securities and Exchange Commission, 2005. Regulation NMS, Final Rule, Release No. 34-51808, June 9, 2005. Available at SEC website, (http://www.sec.gov/rules/final/34-51808.pdf).
Shleifer, A., Wolfenzon, D., 2002. Investor protection and equity markets. Journal of Financial Economics 66, 3–27.
Spamann, H., 2010. The 'anti-director rights index' revisited. Review of Financial Studies 23, 467–486.
Stulz, R., 1999. Globalization, corporate finance, and the cost of capital. Journal of Applied Corporate Finance 12, 8–25.
Stulz, R., 2005. The limits of financial globalization. Journal of Finance 60, 1595–1638.
Stulz, R., 2009. Securities laws, disclosure, and national capital markets in the age of financial globalization. Journal of Accounting Research 47, 349–390.
Weild, D., Kim, E., 2010. Market Structure is Causing the IPO Crisis – and More. Grant Thornton Capital Markets Series, Grant Thornton International.