



# **International Financial Integration and Entrepreneurial Firm Activity**

**Laura Alfaro  
Andrew Charlton**

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# International Financial Integration and Entrepreneurial Firm Activity

**Laura Alfaro**

Harvard Business School and NBER

**Andrew Charlton**

London School of Economics

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## Abstract

We explore the relation between international financial integration and the level of entrepreneurial activity in a country. We use a unique firm-level data set in a broad sample of developed and developing countries, which enables us to present both cross-country and industry-level evidence. We find a positive robust correlation between de jure and de facto measures of international financial integration and proxies for entrepreneurial activity such as entry, size, and skewness of the firm-size distribution. We then explore potential channels through which foreign capital may encourage entrepreneurship. We find that entrepreneurial activity is higher in industries which have a large share of foreign firms in vertically linked industries. Second, we find that entrepreneurial activity in industries which are more reliant on external finance is disproportionately affected by international financial integration.

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Key Words: international financial integration, capital mobility, entrepreneurship, firm entry, capital controls, foreign direct investment.

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\* Laura Alfaro, Harvard Business School, Morgan 263, Boston MA, 02163, U.S. (e-mail: [lalfaro@hbs.edu](mailto:lalfaro@hbs.edu)). Andrew Charlton, London School of Economics, Houghton Street London, WC2A 2AE, U.K (e-mail: [a.charlton@lse.ac.uk](mailto:a.charlton@lse.ac.uk)). We thank Galina Hale, Ricardo Hausmann, Jean Imbs, Lakshmi Iyer, Simon Johnson, Cheryl Long, Roberto Rigobon, Steve Redding, Dani Rodrik, Kathy Terrell, Eric Werker, and participants at the Stanford Institute for Theoretical Economics summer workshop on Emerging Market Firms' Behavior, the Harvard Business School-BGIE seminar, the Kennedy School's LIEP, LACEA Conference, the Capital Flows-IMF 7<sup>th</sup> Jacques Pollak Conference, the AEA meetings, and seminars at the London School of Economics, the University of Michigan, and Columbia Business School seminar for valuable comments and suggestions. We are grateful to Todd Mitton for helping us with the IO data, Dun & Bradstreet and Dennis Jacques for helping us with the D&B data set, and HBS and LSE for financial support to purchase the data. We further thank Pamela Arellano for excellent research assistance.

## 1 Introduction

In this paper we explore the relation between a country's level of international financial integration, that is, its links to international capital, and the level of entrepreneurial activity. Researchers have stressed the roles of entrepreneurship, new firm activity, and economic dynamism in economic growth.<sup>1</sup> The empirical effects of international capital mobility on firm dynamism and entrepreneurial activity, however, have received little attention in the literature albeit the intense academic and policy debates. Using different measures commonly employed in the literature in a new firm-level data set in a broad sample of developed and developing countries, we find higher entrepreneurial activity in more financially integrated countries and countries with fewer restrictions on international capital flows. We further explore various channels through which international financial integration can affect entrepreneurship (a foreign direct investment channel and a capital/credit availability channel) and provide consistent evidence of our results.

The theoretical effects of international financial integration on entrepreneurship are ambiguous. The rapid rate of global financial integration, perhaps most directly observed in the explosive growth of foreign direct investment (FDI), has raised concerns in both the public and academic communities about potential negative effects of international capital on the development of domestic entrepreneurs with negative consequences to the economy as a whole. It has been argued that foreign enterprises crowd out local efforts, and thus impart few, if any, benefits to the local economy. Grossman (1984) shows that international capital, and in particular FDI, can lead to the crowding out of the domestic entrepreneurial class.<sup>2</sup> Hausmann and Rodrik (2003) argue that *laissez-faire* and in particular openness can lead to too little investment and entrepreneurship *ex-ante*. Similar concerns were raised by an earlier development literature. Hirschman (1958), for example, warned that in the absence of linkages, foreign investments can have negative effects on an economy (the so called 'enclave economies'). More generally, researchers have argued that in the presence of pre-existing distortions and weak institutional settings, international capital mobility can increase the likelihood of financial crises; higher volatility and risk can reduce entrepreneurship and innovative efforts in a country. Some scholars have asserted that open capital markets may be detrimental to economic development (see Bhagwati, 1998 and Rodrik, 1998). As Eichengreen (2001) notes, "[C]apital account liberalization, it is fair to say, remains one of the most controversial and least understood policies of our day."

On the other hand, access to foreign resources can enable developing countries with little domestic capital to borrow to invest, and resource constrained entrepreneurs to start new firms. Indeed,

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<sup>1</sup> Entrepreneurship and firm creation are often described as the keys to economic growth (Schumpeter 1942).

<sup>2</sup> In addition, if foreign firms borrow heavily from local banks, instead of bringing scarce capital from abroad, they may exacerbate domestic firms' financing constraints by crowding them out of domestic capital markets; see Harrison, Love and McMillan (2004) and Harrison and McMillan (2003).

availability of funds has been shown to be an important determinant of entrepreneurship.<sup>3</sup> International financial integration should also facilitate international risk sharing and thus lower the cost of capital for many developing countries, and, by fostering increased competition, improve the domestic financial sector with further benefits to entrepreneurship.<sup>4</sup> Furthermore, researchers have stressed the potential positive role of knowledge spillovers and linkages from foreign firms to domestic firm activity and innovation.<sup>5</sup>

Whether international capital mobility is fostering or destroying entrepreneurship is a critical question in academic and policy circles. Yet, empirical analysis of the effects of international capital mobility on entrepreneurial activity and firm dynamism are all but absent from the literature. This is largely due to the difficulty of obtaining an international data set sufficiently comprehensive to support studies of firm dynamism in both developed and developing countries. As Bartelesman, Haltinwanger and Scarpetta (2005) note, at the firm level, no comprehensive survey exists with data for multiple countries, nor are there international data sets that contain micro-level data for comprehensive samples of firms.<sup>6</sup>

We overcome this problem by using a new establishment-level data set in 98 countries in 1999, 2004 and 2007. Our data set contains both listed and unlisted firms across a broad range of developed and developing countries at different stages of international financial integration. Over the last decades, barriers to international capital mobility have fallen in developed countries and diminished considerably in many developing countries. But despite recent trends, restrictions on international financial transactions are still quantitatively important for many countries, and *de facto* flows remain low relative to those predicted by standard models, in particular, for developing countries (see Alfaro, Kalemli-Ozcan, and Volosovych (2006) for an overview of recent trends in international capital mobility). Limitations with the data notwithstanding, the coverage of the data enables us to study the differential effects of restrictions on capital mobility on entrepreneurial activity.

Identifying the effects of international financial integration on entrepreneurial activity is, however, not an easy task. There is no one definition of entrepreneurship or what it entitles, hence, no one variable to measure it. Different views in the literature have emphasized a broad range of activities including innovation (Schumpeter, 1942), the bearing of risk (Knight, 1921), and the organization of the

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<sup>3</sup> Evans and Jovanovic (1989) show theoretically that wealth constraints negatively affect entrepreneurship. Evans and Leighton (1989) find evidence that credit constraints are a critical factor in the founding and survival of new firms.

<sup>4</sup> Increased risk sharing opportunities might encourage entrepreneurs to take on more total investments, or shift production activities towards higher-risk, higher-return projects; see Obstfeld (1994).

<sup>5</sup> Markusen and Venables (1999) propose a model that suggests that FDI will be associated with firm turnover. Although entry of foreign firms increases competition and, initially, forces the exit of domestic firms, in the longer run multinationals might stimulate local activity through linkages with the rest of the economy. See also Rodriguez-Clare (1996) for a formalization of the linkage effects between foreign and domestic firms.

<sup>6</sup> Bartelesman, Haltinwanger and Scarpetta (2004, 2005) review the measurement and analytical challenges of handling firm level data and attempt to harmonize indicators of firm dynamics for a number of countries. Their harmonized data, however, is available for few countries (mostly industrialized) and for many countries that data is confidential.

factors of production (Say, 1803). Therefore, we analyze a variety of measures commonly used in the literature as imperfect proxies for various aspects of entrepreneurial activity (see Desai, Gompers, and Lerner 2003, Klapper, Laeven, and Rajan 2005, and Black and Strahan 2002). We focus on firm entry, average firm size and skewness of the firm-size as these measures better capture firm activity but also consider age and vintage (a size-weighted measure of the average age of the firm). The literature distinguishes between *de jure* indicators of financial integration, which are associated with capital account liberalization policies, and *de facto* indicators, which are associated with actual capital flows.<sup>7</sup> We use both, as they capture different aspects of international capital mobility and financial integration. We also control for other determinants found in the literature to affect the level of entrepreneurship such as local development level, market size, and institutional constraints.

The richness of our data enables us to study the relationship between international financial integration and entrepreneurial activity at two levels. We find countries with more relaxed capital controls (*de jure* integration) or receiving a higher volume of foreign capital (*de facto* integration) were on average more likely to experience greater entrepreneurship proxied by increased activity among new and small firms. Our results are both statistically and economically significant and are robust to different measures and specifications. In addition, we look at industries within countries using the methodology of Rajan and Zingales (1998) and Klapper, Laeven and Rajan (2005) which focuses on cross-industry, cross-country interaction effects to determine whether the effect of foreign capital is higher in industries which have a higher natural level of entrepreneurship using the United States as a proxy for the “natural activity” in an industry. We find that entry and skewness of the firm size distribution are relatively higher in naturally-high-activity industries when the country has relatively high international capital mobility. The results confirm our previous findings. While we are reluctant to over-interpret these simple correlations, they do present to our knowledge the first cross-country evidence of the effect of foreign capital on entrepreneurship.

The nature of our data further allows us to consider various potential channels through which foreign capital might affect entrepreneurship. First, international financial integration might increase capital in the economy and improve its intermediation (a capital/credit availability channel). Although small firms might not be able to borrow directly in international markets, improved financial intermediation and other firms’ (and the government’s) international borrowing might ease financing constraints until some of the additional capital finds its way to new firms. Second, local firms might benefit from spillovers and linkages from foreign firms (FDI channel). We test for the former channel by exploring whether entrepreneurial activity is higher in firms that are more dependent on external finance as defined by Rajan and Zingales (1998). The evidence does indeed suggest this to be the case. In terms of the FDI channel, our data set has the advantage of enabling us to distinguish between foreign and local

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<sup>7</sup> See Prasad et al. (2003) for a discussion of the different indices and measures used in the literature.

firms. We find that entrepreneurial activity is higher in industries which have a large share of foreign firms or in vertically linked industries. Our results are consistent with our previous findings.

Important concerns in our analysis are related to sample biases, policy endogeneity and omitted variables biases in terms of establishing the causality between international financial integration and proxy variables of entrepreneurial activity. Capital account liberalization and entrepreneurial activity might, for example, be positively correlated with an omitted third factor. If that factor was a government policy—for example, a policy-maker anticipating improvements in external conditions liberalizes a country's capital account—we would observe capital liberalization and intensified firm activity. We take different steps to mitigate these concerns. We control for other variables that might affect entrepreneurial activity. We believe the extensive robustness analyses we perform eases concerns about potential omitted variables. We also look at different proxies for entrepreneurial activity and capital mobility. We analyze industry proxies as opposed to country ones, and test effects controlling for the different sectors. Even if firm dynamism is correlated because of an omitted common factor, it is hard to argue that the latter affects the relation between capital flows and entrepreneurial activity in a systematic way for firms in sectors with different characteristics. Although, naturally, it is impossible to control for all possible variables that might be correlated with international financial integration and firm activity, the results using different sample periods, estimation techniques, and the Rajan and Zingales (1998) methodologies further ease concerns that our results are driven by these biases. Finally, we find that mechanisms consistent with the correlation unveiled are supported by the empirical evidence. However, even after all of these tests, our estimates should be interpreted with caution.

We noted earlier the scarcity of empirical work on the effects of international capital mobility on entrepreneurial activity. A number of papers have studied how different aspects of capital account liberalization affect a firm's financing constraints and the cost of capital. Chari and Herny's (2004) examination of the effect of stock market liberalization in 11 emerging markets suggests that publicly-listed firms that become eligible for foreign ownership experience a significant average stock price revaluation and significant decline in the average cost of capital. Harrison, Love and McMillian (2004) find FDI inflows to be associated with a reduction in firms' financing constraints while restrictions on capital account transactions negatively affect their financial constraints.<sup>8</sup> Gorg and Strobl (2002) find foreign presence to be associated with higher entry in Ireland. Galindo, Schiantarelli, and Weiss (2007) study whether financial liberalization has increased the efficiency of the allocation of investment in publicly traded firms in 12 developing countries. Recent work has studied the role of foreign banks (see Detragiache, Tressel and Gupta (2006) for survey and empirical finding). These studies, in particular

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<sup>8</sup> The authors use large publicly traded firm level data for 38 countries and 7079 firms from the Worldscope data base. In contrast, Harrison and McMillian (2003) find that in the Ivory Coast for the period 1974-1987, borrowing by foreign firms aggravated domestic firms' credit constraints.

<sup>10</sup> Scarpetta et al. (2002) use firm level survey data from OECD to study exit and entry. They find that higher product and labor regulations are negatively correlated with entry for small and medium sized firms in OECD. Using the Amadeus data set for 1999, Desai, Gompers, and Lerner (2003) and Klapper, Laeven, and Rajan (2005)

those examining developing countries, tend not to use firm level data or restrict the analysis to publicly traded firms due to availability constraints. Overall, our results are consistent with their findings.

Our paper also relates to the research on the effects of the external environment on entrepreneurship. Bertrand and Kamarz (2002) study of the expansion decisions of French retailers following new zoning regulations in France. Scarpetta et al. (2002), Desai, Gompers, and Lerner (2003), Klapper, Laeven, and Rajan (2005), and Kumar, Rajan, and Zingales (1999) have studied different aspects of the external environment on firm creation and entrepreneurship in a cross-section of European countries. Other work on aspects of entrepreneurship include Johnson et al.'s (2002) finding that investment by entrepreneurs is lower in countries with weak property rights; Black and Strahan's (2002), and Guiso, Sapienza, and Zingales' (2004) finding that competition in the banking sector and financial development fosters firm entry in the U.S. and Italy respectively; Beck, Demirguc-Kunt, Laeven, and Levine's (2006) finding that financial development exerts a disproportionately positive effect on small firms; and Acemoglu, Johnson and Mitton (2008) cross-country study of concentration and vertical integration. Most of these papers, with the exception of the latter, use data from the Amadeus dataset (which has data for Western and Eastern Europe only) or the Worldscope database (which includes information for a large number of countries but covers only relatively large, publicly trade firms).<sup>10</sup> Our paper also contributes to this literature by exploring the determinants of firm dynamism in a broader sample of developed and developing countries using data for both private and public firms. To our knowledge our paper is the first to study different aspects of firm entrepreneurship and the effects of international capital. Most of the literature has not controlled for the role of international financial integration nor study the effects of financial market development using firm level data in a sample that encompasses a broader sample of developing countries. Our results show a positive and significant effect of international capital even after controlling financial market development.

Finally, by focusing on micro effects, our results contribute to the broader debate on the effects of international financial integration.<sup>11</sup> As argued by Schumpeter, firm entry is a critical part of an economy's dynamism. Previous work has documented the important effects of new firm entry and economic dynamism on economic growth. Obstacles to this process can have severe macroeconomic consequences. International competition is an important source of creative destruction. Researchers have documented significant productivity, firm dynamism, and reallocation effects from trade openness with positive effects for specific countries. This paper documents and studies the relation between firm

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obtain similar findings. Kumar, Rajan and Zingales (1999) use data from Enterprise Europe for either 1991 or 1992. Black and Strahan (2002) use data for the U.S. from D&B, Acemoglu, Johnson, and Mitton (2008) use also D&B data for 769,100 firms; Beck et al. (2006) use industry level data complemented by U.S. Census data. Publicly listed firms account for only 25 percent of jobs, even in the United States. Although it is difficult to quantify this number for our broad sample of countries, presumably, publicly traded firms are of much greater importance in the United States than in most other countries.

<sup>11</sup> See Henry (2006) and Kose et al. (2006) for recent reviews of the literature.

dynamism and international financial integration. Our results suggest that, contrary to the fears of many, international financial integration has been associated with greater firm activity.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 presents the main empirical results. Section 4 discusses potential channels and presents evidence consistent with the main results. Section 5 concludes.

## **2 Data and Descriptive Statistics**

### **2.1 Firm Level Data**

Recent theoretical work in macroeconomics, trade, and development has emphasized the importance of firm heterogeneity and firm-level dynamism to economic activity. Cross-country empirical investigations at the firm-level, however, are notoriously challenging because of both the lack of data and the difficulty of comparing the few high quality time-series datasets that are available (mostly in rich countries). The problem of paucity of data is particularly acute for developing countries, and selection problems tend to be associated with biases in and potential endogeneity of the cross-country sample frame.

The reason for the data constraint is simple: economic censuses of firms are infrequently collected due to high cost and institutional restrictions that impose an “upper-bound” on research, especially in poor countries, but also in rich ones. No institution has the capacity or resources to overcome the limitation of “lack of census data” for a wide range of countries and periods. Hence, most methodologies face this restriction. The implications of firm heterogeneity, however, merit going forward within the existing data limitations. There is a clear need to combine data from multiple countries (in particular, developing countries) in order to understand, for example, the role of institutional policy differences. Researchers have thus sought to find other sources of business “compilations” (registries, tax sources) such as the WorldBase data set used in this paper.<sup>12</sup>

In this paper, we use data from WorldBase compiled by Dun and Bradstreet, a database of public and private companies in more than 200 countries and territories.<sup>13</sup> The leading U.S. source of commercial credit and marketing information since approximately 1845, D&B presently operates in the

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<sup>12</sup> Of these, most studies have used the Amadeus data because it includes data on both publicly listed and private firms. The Amadeus data is provided by Bureau Van Dijk (BvD), a European electronic publishing firm which gathers the data through information providers of Amadeus data within each country. In some countries these providers gather the national data within each country (e.g., Companies House in the UK) and in other countries (particularly Eastern Europe) they collect it direct from firms. These national companies collect the data from the national public body in charge of collecting the annual accounts in its country. Because of different disclosure requirements, the amount and type of information also varies among countries.

<sup>13</sup> D&B Early uses of the D&B data include Caves’ (1975) size and diversification pattern comparisons between Canadian and U.S. domestic plants as well as subsidiaries of U.S. multinationals in Canada, and Lipsey’s (1978) observations regarding the reliability of the data for U.S. More recently, Harrison, Love, and McMillian (2004) use D&B’s cross-country foreign ownership information. Other research that has used D&B data includes Black and Strahan’s (2002) study of entrepreneurial activity in the United States, and Acemoglu, Johnson, and Mitton’s (2008) cross-country study of concentration and vertical integration and Alfaro and Charlton (2008) analysis of vertical and horizontal activity by multinationals.



different countries and territories either directly or through affiliates, agents, and associated business partners. The data, compiled from a number of sources including partner firms in dozens of countries, telephone directory records, Web sites, and self-registration, are meant to provide clients with contact details and basic operating information about potential customers, competitors, and suppliers. Information from local insolvency authorities and merger and acquisition records are used to track changes in ownership and operations.

D&B uses the United States Government Department of Commerce, Office of Management and Budget, Standard Industrial Classification Manual 1987 edition to classify business establishments. In fact, Dun & Bradstreet is a government-approved source for assigning SIC codes to companies. In 1963, the firm introduced the Data Universal Numbering System (the D&B D-U-N-S® Number), which it uses to identify businesses numerically for data-processing purposes. The system supports the linking of plants and firms across countries and tracking of the history of plant and name (including potential) changes. The D&B D-U-N-S Number has become a standard business identifier for the United Nations, European Commission, and U.S. Government.

WorldBase reports establishment age, number of employees, and the four-digit SIC-1987 code of the primary industry in which a firm operates and the SIC codes of up to five secondary industries, listed in descending order of importance, as well as sales and exports, albeit with much less extensive coverage of the latter two. We exclude establishments missing primary industry and year started information, and government related firms. The criteria used to clean the sample are detailed in the Appendix A which also describes data set in further detail. Table 1 lists the countries represented in the data set and main summary statistics at the country level.

In our view, Dun and Bradstreet's WorldBase, while not without problems, is the best database to analyze our question. In particular it has four main advantages over most other sources. First it is much larger, including public and private firms, and we have obtained data at three time periods: 1999/2000, 2004/2005, and 2006/2007.

Second, data sources restricted to Europe such as Amadeus are not useful for our purposes because they do not have broad coverage of countries and in particular of developing countries with different levels of international financial integration, WorldBase by contrast has data in more than 200 countries and territories. We excluded territories with fewer than 80 observations, and those for which the World Bank provides no data—this leaves us with observations in 98 countries—creating significant variation in international financial integration.

Third, the unit of observation in WorldBase is the establishment. Establishments like firms have their own addresses, business names, and managers, but might be partly or wholly owned by other firms.

We are therefore able to observe new enterprises spawned from existing firms or, by aggregating to the firm level, we can examine only independent new firms.<sup>14</sup>

Fourth, Dun & Bradstreet compile their data from a wide range of sources, whereas other databases collect primarily from national firm registries. Dun & Bradstreet compiles the WorldBase data from a number of sources with a view to providing its clients contact details and basic operating information about potential customers, competitors, and suppliers. All information is verified centrally via a variety of manual and automated checks. Over its many years in business, D&B has devised many methods of checking its data.<sup>15</sup> The wide variety of sources from which Dun & Bradstreet collects data reduces the likelihood that the sample frame will be determined by national institutional characteristics. In Appendix A, we compare the Dun & Bradstreet data to the other data sources. The comparison illustrates that our data set seem to be well suited for our analysis.

## 2.2 Entrepreneurship Measures

How to measure entrepreneurship? Given the different perspectives in the literature on the role of entrepreneurs in an economy, definitions have emphasized a broad range of activities including the introduction of innovation (Schumpeter, 1942), bearing of risk (Knight, 1921), bringing together of factors of production (Say, 1803). In general, entrepreneurs are risk-bearers, coordinators and organizers, gap-fillers, leaders, and innovators or creative imitators.

If there is no one way to define entrepreneurship, there is certainly no one way to measure it. Hence, while simple comparisons of different indicators remain difficult to interpret, we use a variety of proxies commonly used in the literature which should give us an overall picture of entrepreneurial activity in the country (and mitigate concerns related to any one measure in particular). Following Black and Strahan (2002), Desai, Gompers, and Lerner (2003), Scarpetta et al. (2002), and Klapper, Laeven, and Rajan (2005), we calculate for each industry/country pair the rate of entry, average establishment size, the skewness of size, age, and vintage.<sup>16</sup>

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<sup>14</sup> Our view is that the expansion of activity by existing firms via new plants is an indication of entrepreneurial activity. In the literature, the mapping between theory and data is unclear with respect to firm vs. establishment variation, but is probably closer to establishment variation. Product differentiation and TFP variation in Melitz (2003) type models, for example, probably maps best into establishment level variation. Lucas's (1978) span of control is likely relevant at the firm and establishment level. Large firms in countries like the United States, for example, are multi-establishment, multi-product, and horizontally and vertically differentiated. As noted in the US Census documentation, many companies own or control establishments that engage in different geographical areas and different kinds of business. Because many factors are likely at work (see Sutton 1997), we prefer to use establishment, but have performed robustness tests using wholly owned firms obtaining similar results.

<sup>15</sup> For more information about the quality control processes see: [http://www.dnb.com/us/about/db\\_database/dnbinfoquality.html](http://www.dnb.com/us/about/db_database/dnbinfoquality.html).

<sup>16</sup> Here and henceforth, we use the terms firm and establishment interchangeably when no confusion is caused by doing so. Because of the year differences in our data, we do not calculate exit. As Bartelesman, Haltinwanger and Scarpetta (2005) note, about 20% to 40% of entering firms fail within the first two years of life. The Global Entrepreneurship Monitor (GEM) publishes indices of entrepreneurial activity. These data did not seem to be empirically consistent with other measures used in the literature and hence are not used in this paper.

*i. Entry:* Entry is defined as the number of new establishments (two years of less) divided by the total number of firms in the country/industry pair. Markets that provide more opportunities are said to be more dynamic and entrepreneurial. Greater access to capital and improvements in a country's financial markets associated with international financial integration should ease capital constraints and positively influence entry decisions in a country.<sup>17</sup>

*ii. Size:* We calculate average establishment size measured by the log of the average number of employees in each country/industry pair. Small firms play an important role in the economy as they are often portrayed as sources of innovation, regeneration, change and employment. Although the prediction is not unambiguous, we expect lower levels of capital rationing associated with international financial integration to result in greater numbers of small firms being able to enter and survive in the market.

*iii. Size Distribution:* We also examine the relation between skewness of the establishment-size distribution and international financial integration. If capital constraints are operative in shaping the nature of industrial activity, the firm-size distribution should be skewed. Cooley and Quadrini (2003) and Cabral and Mata (2003) argue that in the presence of capital constraints, size distribution will be skewed. In Cabral and Mata (2003), for example, firm growth depends upon investment and access to capital. Capital constraints tend also to affect younger firms that are likely to be capital rationed.

*iv. Age:* In the robustness section, we use average age in each industry/country pair—an alternative measure of firm turnover. We expect greater financial integration to be associated with more dynamic business environments and lower average age.

*v. Vintage:* We also use in the robustness section a weighted average measure of age. Following Desai, Gompers and Lerner (2003) vintage is the weighted (by numbers of employees) average age of each productive unit in each country/industry pair. This measure shows the importance of young firms to the productive capacity of an industry. Low vintage indicates that young firms dominate the productive capacity. The predictions with respect to vintage are not unambiguous, although we expect smaller, younger firms to benefit from greater access to international funds. Appendix A explains all variables in detail.

### **2.3 Capital Mobility Data**

How to measure international financial integration? Assessing a country's integration with international financial markets is a complicated task. The process, that is, the change in the degree to which a country's government restricts cross-border financial transactions, is complex and involves multiple phases. Markets can be liberalized gradually and the effects smoothed if the reforms can be anticipated.<sup>18</sup> The literature, as we observed earlier, differentiates between *de jure* financial integration associated with policies on capital account liberalization and *de facto* measures related to actual capital

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<sup>17</sup> This might depend on whether a country is exporting or importing capital, but there might still be an improvement in intermediation of capital.

<sup>18</sup> Anticipation and gradualness should bias our results away from finding an effect.

flows. *De jure* liberalization processes might not reflect *de facto* liberalization processes. If, for example, one part of the system is liberalized, investors might use it to circumvent other controls. Some reforms might not be credible, and countries, albeit officially open, might nevertheless not have access to foreign capital. Hence, we use both measures of financial integration.

Most empirical analyses that require a measure of capital account restrictions use an index constructed from data in the International Monetary Fund's (IMF's) *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*.<sup>19</sup> This is a rule-based indicator in that it focuses on *de jure* restrictions imposed by the legal authorities in each country. The index uses data on different restrictions: capital market securities, money market instruments, collective investment securities, derivatives and other instruments, commercial credits, financial credits, guarantees, securities, and financial backup facilities, direct investment, real estate transactions, and personal capital transactions. A corresponding dummy variable takes the value of 1 if each of the restrictions is present in each country, zero otherwise. We use the average of the dummies as our measure of restrictions for each country.

Our analysis employs the following *de facto* measures of capital mobility which are described in detail in Appendix A: *i. Capital Inflows/GDP*: which is the sum of flows of FDI, equity portfolio, financial derivatives, and debt. *ii. Inflows of Foreign Direct Investment/GDP, Net*: which emphasizes the potential benefits derived from FDI associated with technological transfers, knowledge spillovers, and linkages that go beyond the capital foreign firms might bring into a country.<sup>20</sup>

### 3 Empirical Analysis

#### 3.1 Summary Statistics

Table 1 presents summary statistics for our main variables for 1999, 2004 and 2007. Table 2 presents the correlation matrix of the main variables. There is wide variation in entrepreneurial activity across countries, industries and years. In 2004, for example, countries such as Denmark, Netherlands, and South Korea exhibit high firm creation, Papua New Guinea and Yemen relatively low firm creation; median employment per firm was relatively high for Indonesia, Papua New Guinea, and Thailand and relatively low for Netherlands, Belgium, and Italy. There is also wide variation on *de jure* and *de facto* capital mobility. Countries such as Costa Rica, Netherlands, and Belgium have low levels of *de jure*

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<sup>19</sup> The index is constructed from data on restrictions presented in the survey appendix. In 1997, the IMF changed the way they report the capital controls data. The new classification is a vast improvement over the previous measure, although issues regarding circumvention of controls remain.

<sup>20</sup> We also use additional measures (some of which were not available for 2007): *Stock of Foreign Liabilities/GDP*: which proxies the thickness of banking and equity relationships (both FDI and portfolio investment) with other countries; *Gross Capital Flows/GDP*: which captures a country's overall foreign capital activity; *Equity Inflows/GDP* to capture the relation between entrepreneurial activity and equity flows of capital (sum of foreign direct investment and portfolio inflows); and *Net Capital Flows/GDP* focusing on the net capital available to the economy obtaining similar results (available upon request).

restrictions according to the IMF index, while Zimbabwe, Papua New Guinea and Thailand high levels of restrictions.<sup>21</sup>

### 3.2 Panel Analysis

Our initial regressions investigate whether there is variation in entrepreneurial activity across countries and time that is correlated with capital mobility (*de jure* or *de facto*). We run the following specification on our data for 1999, 2004 and 2007:

$$E_{ict} = \alpha K_{ct} + \beta X_{ct} + \delta_i + \delta_c + \delta_t + \varepsilon_{ict} \quad (1)$$

where  $E_{ict}$  corresponds to the entrepreneurial activity measure in industry  $i$  of country  $c$  at time  $t$ ,  $K_{ct}$  corresponds to the measure of capital account integration,  $X_{ct}$  corresponds to country level controls,  $\delta_i$  is a full set of industry dummies,  $\delta_c$  is a full set of country dummies and  $\delta_t$  corresponds to country dummies, and  $\varepsilon_{ic}$  corresponds to the error term. Our analysis is at the two-digit industry level. The industry dummies control for cross-industry differences in technological level or other determinants of entrepreneurship. Hence, in equation (1), we look at whether, for each industry, firms in a country with greater capital mobility exhibit more entrepreneurial activity than firms in a country with less capital mobility. In other words, cross-country comparisons are relative to the mean propensity to “generate entrepreneurial activity” in an industry relative to the industry and time averages. The estimation procedure uses White’s correction for heteroskedasticity in the error term. Because the capital mobility variables vary only at the country level, we present results with standard errors corrected at the country level (clustering).

In terms of our controls, the literature has found the institutional and business environment as well as industry characteristics to affect the levels of entrepreneurial activity in a country. In the main specification we use the (logarithm of) GDP per capita to proxy for development. The level of economic development is likely to affect the attractiveness/success of becoming an entrepreneur. We use the (logarithm of) GDP to control for scale effects that might affect entrepreneurial activity. We control for the rate of real GDP growth to capture current economic activity. In addition, we use various controls for institutional quality. We use data from the International Country Risk Guide (ICRG), a monthly publication of Political Risk Services. We use specifically the variables non-corruption, law and order, and bureaucratic quality, all of which we expect to be positively related to entrepreneurial activity.<sup>22</sup> We

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<sup>21</sup> Ireland experienced particularly high flows during this period. Results are robust to excluding Ireland from the sample.

<sup>22</sup> ICRG presents information on the following variables: investment profile, government stability, internal conflict, external conflict, no-corruption, non-militarized politics, protection from religious tensions, law and order, protection from ethnic tensions, democratic accountability, and bureaucratic quality. We do not use the entire index as we do not have, a priori, a view on how some of these variables might affect entrepreneurial activity, and suspect that some might have opposite effects.

use domestic credit as a percentage of GDP control for financial market development which we expect to have a positive effect.<sup>23</sup>

In our main regressions, we run specification (1) on the different measures of entrepreneurship: entry, firm size, and skewness of the firm-size distribution, and on different measures of capital account integration, namely, the IMF index, capital inflows, FDI inflows, stock of foreign liabilities, and gross flows. Our main control variables are (log of) GDP, (log of) GDP per capita, GDP growth, domestic credit to GDP, and indices of bureaucracy, non-corruption, and law and order. We use weights in the regressions to reflect the different size of each industry/country observation.<sup>24</sup> For many industries, the rate of firm entry is zero or negligible. To account for this large number of zeros and our upper bound at 1, we use a Tobit estimation model for the firm entry regressions.<sup>25</sup> This specification allows us to observe a regression line that is not heavily weighted by the large number of industries with a wide range of characteristics but which did not generate any observed new firms in our sample period.

Tables 3a-3c present the main results for our data that suggest a negative and significant relation between different measures of entrepreneurial activity and restrictions on capital mobility. We performed additional robustness checks some of which we report on Appendix B.

Table 3a presents results for firm entry as the dependent variable. In column (1), the marginal effect of the IMF index conditional on the dependent variable (rate of firm entry) being uncensored is -3.1. Consider a movement from the 25<sup>th</sup> percentile to the 75<sup>th</sup> percentile in the distribution of the index of restrictions. Based on the results shown in column (1), we have, on average, 1.6 percent more entry in an industry in the country with less restrictive controls. This represents, in industries with average rates of entry such as textiles and apparel, a 29 percent increase in entry over average entry. Columns (2)-(5) present the main results of controlling for *de facto* measures of capital account integration. A movement from the 25<sup>th</sup> percentile to the 75<sup>th</sup> percentile of the Capital Inflows/GDP variable is associated, based on the results in column (2), represents a 5 percent increase in entry over average entry. In terms of the other control variables, our results are in line with the literature. The level of development and growth are positively and significantly related to entrepreneurship, and we find a positive effect of non-corruption and law and order.

In Table 3b, the dependent variable is the log of employment in the industry/country pair. As seen in Column (1), an inter-quartile reduction in the IMF index (less restrictive controls) is associated with a decrease in average firm size by 4 percent. Similar increases in the Capital Inflows/GDP variable are associated with a significant decrease in average firm size of 31 percent.

In Table 3c, the dependent variable is skewness of the firm-size distribution. Our results are both economically and statistically significant. Column (1) of the table shows the effect of the IMF index on

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<sup>23</sup> In the robustness section we use additional measures for financial development and regulation.

<sup>24</sup> We find similar results when unweighted and when weighted by either the number of firms or the total employment in the industry/country.

<sup>25</sup> When we run the regression using OLS and clustering, the results are significant.

the skewness of the firm size distribution in each industry to be negative and significant. To get a sense of the magnitude of the effect of a reduction in the IMF index on the level of entrepreneurial activity, consider a movement from the 25<sup>th</sup> percentile to the 75<sup>th</sup> percentile in the distribution of the index of restrictions; based on the results shown in column (1), 8 percent reduction of average industry skewness. In terms of the effect of *de facto* measures of integration on the firm size distribution, a similar interquartile movement of the Capital Inflows/GDP variable is associated, based on the results in column (2), with a 17 percent increase over the industry average.

### 3.3 Cross-Industry, Cross-Country Interaction Effects

In addition, our data allows us to look at cross-industry, cross-country interaction effects following the methodology of Rajan and Zingales (1998) and Klapper, Laeven, and Rajan (2005). We run:

$$E_{ict} = \theta(Z_i \times K_c) + \delta_i + \gamma_c + \delta_t + \varepsilon_{ic} \quad (2)$$

where  $E_{ict}$  corresponds to the entrepreneurial activity measure in industry  $i$  of country  $c$ , at time  $t$ ,  $\delta_i$ ,  $\gamma_c$ , and  $\delta_t$  represents industry, country and time dummies. The industry indicators correct for industry-specific effects; country dummies correct for country-specific variables. The focus of analysis is on the interaction term  $\theta$  between a country characteristic ( $K_c$ ) and an industry characteristic,  $Z_i$ . For country characteristics, we use the capital mobility measures. For industry characteristics, following these authors, we use the United States as a proxy for the “natural” entrepreneurial activity in an industry reflecting technological barriers in that industry like economies of scale. “Of course, there is a degree of heroism in assuming that entry in the United States does not suffer from artificial barriers,” write Klapper, Laeven, and Rajan (2005, p.17), but the methodology requires only that rank ordering in the United States correspond to the rank ordering of natural barriers across industries, and the latter rank ordering correspond to that of other countries. This methodology, as explained by the authors, enables us to address issues associated with country effects. We examine the differential effects of country level variables across industries and by correcting for industry effects we also correct for the fact that average entrepreneurial activity may depend on the industries’ characteristics. This is equivalent to de-meaning the variables using their industry and country averages and thus removing some of the sample selection problems.

Focusing on entry and the skewness of the firm size-distribution, we find the coefficient on the interaction term  $\theta$  to be positive and significant for the different proxies of capital integration as seen in Table 4 (results using data for 1999, 2004, and 2007). Moreover, the magnitude of the relationship is economically significant. For example, a change in the IMF index equivalent to an increase from the 25<sup>th</sup> to the 75<sup>th</sup> percentile in our sample reduces the percentage of new firms in an industry with average levels

of entry in the U.S. (textiles) by 6%. Similar interquartile changes for the inflows of capital are associated with increases of 3%.

### 3.4 Endogeneity and Sample Intensity: Discussion

Important concerns related to all the previous findings include whether a potential omitted third factor explains the relation between the different measures of entrepreneurship and international financial integration and whether reverse causality might be driving our results. The Rajan and Zingales methodology mitigates some concerns about endogeneity, but we also undertake several additional checks to examine the robustness of our results, some of which we report in Appendix B.

Table B1 shows the coefficients on the capital mobility measures to be stable across specifications with different controls. Table B2 uses additional proxies for entrepreneurship and other measures of *de facto* financial integration. Table B3 shows our results to be robust to using only the manufacturing sector, only developed countries, excluding the United States from the sample, and adding regional dummies, controlling for trade and inflation. Table B4 and B5 shows our results to be robust to controlling for other measures of regulation and level of domestic financial development as well as other macroeconomic controls.

In addition there are concerns that our results might be driven by the sample frame if changes in the sampling intensity of our data in specific countries are correlated with changes foreign capital flows. Nonetheless while we believe that the WorldBase is the best available data to answer our question, we are aware of its limitations. In our final sample, the number of observations per country ranges from more than 7 million firms in the United States to fewer than 90 firms in Burkina Faso. This variation reflects differences in country size, but also differences in the intensity with which Dun & Bradstreet samples firms in different countries and in the number of firms in the informal sector. This raises concerns that our measures of entrepreneurship might be affected by cross-country differences in the sample frame. For example, in countries where coverage is lower or where there are a large number of firms in the informal sector (which are not captured in our data), more established enterprises—often older and larger firms—may be overrepresented in the sample. This may bias our results if the country characteristics which determine the intensity of sampling are correlated with our explanatory variables.

We address this concern in a number of ways. Rather than simply relying on a single measure, we use different proxies for entrepreneurial activity and *de facto* and *de jure* proxies for international financial integration. We use in addition to country and time effects, industry fixed effects in the regression analysis to ensure that within industry variation is emphasized. We compare our results for 1999, 2004 and 2007 and study how changes in our measures of entrepreneurship between these time periods relate to changes in capital restrictions and capital mobility. As Bartelesman, Haltinwanger and Scarpetta (2005) note, since much of the error is country specific, methods that amount to some form of first differencing the data significantly reduce many of the identified problems in firm level data sets. This gives us more confidence that our results are not driven by the sample frame, although it is still



possible that changes in sampling procedure are correlated with changes in financial integration over the same period. Comparisons of the different samples suggested this not to be the case.<sup>26</sup> In particular we analyzed the correlation between the change in the sampling intensity of old firms and the change in the capital mobility measures. The correlation of these variables was low and in fact negative for many of our measures. For example, the correlation between the change in the number of new firms in 04 and in 99 and 07 and 04 and the change in the IMF index and capital inflows on GDP were, respectively, -0.012 and 0.05 and 0.0371 and 0.007. We also repeat our specifications for sub-samples which include only the rich countries which are the most intensively sampled by Dun & Bradstreet. Third, we deal with the possibility that our results might be driven by a small number of observations in country/industry pairs by excluding outliers and weighting country/industry pairs by the number of observations in the industry. In the robustness section we include a measure of the size of the informal sector. Fourth, we include a measure of country sampling intensity in our regressions and find that our results are robust.<sup>27</sup> We also use the Rajan and Zingales (1998) methodology and focus on cross-country, cross-industry interaction effects. By focusing on interactions, we examine the differential effects of country level variables across industries.

Even after all of these tests, our results should be interpreted with caution. Notwithstanding the remarkable consistency in our results, we are reluctant to infer causality. Instead we present these results as strong correlations which motivate the analysis which follows.

#### **4 The Effect of Credit Availability and Foreign Capital on Entrepreneurship**

The Dun & Bradstreet data enable us to go beyond cross country correlations to look at causal channels through which foreign capital may affect domestic entrepreneurship. In particular we investigate whether capital mobility affects entrepreneurship through a change in the activity of domestically-owned firms in contact with foreign firms (an FDI channel) or through the availability of resources (a capital/credit availability channel).

##### **4.1 The Effect of Foreign Capital Through Foreign Direct Investment**

We examine the effect of international financial integration on entrepreneurial activity through foreign firms' (FDI) influence on the creation of new domestic firms. Our data contain information on the nationality of each firm's ownership, which enables us to directly test the FDI channel through the presence of foreign-owned firms. We restricted this analysis to the 2004. In particular, we investigate the effects of foreign firms on new domestically-owned firms in the same industry. Specifically, we run:

$$E_{ict} = \alpha \text{Share of foreign firms}_{ict} + \beta X_{ct} + \delta_i + \delta_c + \delta_t + \varepsilon_{ict} \quad (3)$$

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<sup>26</sup> Conversations with Dun & Bradstreet on their methodology also suggested that this was unlikely to be the case.

<sup>27</sup> We use the ratio of the number of firms in the database to GDP.

where  $E_{ict}$  refers to the percentage of new domestic firms in sector  $i$  in country  $c$  in time  $t$ . The *Share of Foreign Firms*  $S_{ict}$  in sector  $i$  is the number of foreign firms calculated as total firms in industry  $i$  in country  $c$  at time  $t$ .  $X_{ct}$  represents country-level controls.<sup>28</sup>

In Columns (1) and (4) of Table 5, we find the presence of foreign firms to have a positive effect on entrepreneurial activity by domestically-owned firms in the same industry. An increase in the share of foreign firms equivalent to moving from an industry in the 25<sup>th</sup> percentile of the distribution of foreign presence to an industry in the 75<sup>th</sup> percentile is associated with a 37 percent increase over an industry with mean levels of foreign firms. There is a large literature examining horizontal spillovers from FDI. Haskel, Pereira, and Slaughter (2007), for instance, find a positive effects while Aitken and Harrison (1999) find little evidence of horizontal spillovers to domestic firms. The positive effects of FDI are often attributed to the replacement effect of productive multinationals forcing domestic firms to exit. Both the positive and negative effects of FDI are consistent with industrial restructuring and, ultimately, firm turnover. We find evidence that the existence of multinational firms increases the rate of domestic firm creation. This might reflect changes in the industry resulting from large new entrants increasing their market share at the expense of some firms and creating new opportunities for others.

We also test whether our measures of domestic activity are correlated with the presence of multinational firms in upstream and downstream sectors. Given the difficulty of finding input and output matrices for all the countries in our data, we use U.S. input and output (IO) matrices from the U.S. Bureau of Economic Analysis following Acemoglu, Johnson, and Mitton (2008). As the authors explain, IO tables from the U.S. should be informative about input flows across industries in our different sample of countries as long as they are determined by technology. For example, in all countries, car makers use tires, steel and plastic from plants specialized in the production of these intermediate inputs. Hence, for industry  $i$  in country  $c$  we calculate the presence of foreign firms in all industries  $j$  in country  $c$  at time  $t$  which are downstream of industry  $i$ , i.e., foreign firms which may be suppliers to new domestic firms, as:

$$Down\ Stream\ Presence_{ict} = \sum_j (Z_{ji\_US} \times W_{jct}) \quad (4)$$

where  $W_{jct}$  is the total number of foreign firms in industry  $j$  in country  $c$  as a percentage of the total number of firms in industry  $j$  in country  $c$ .  $Z_{ji}$  is an input-output coefficient—we use the ratio of the inputs in industry  $j$  sourced from industry  $i$  in the United States to the total output of industry  $i$  in the United States according to the BEA 4-digit SIC direct input output tables. Thus, the presence of foreign firms downstream from industry  $i$  is weighted by the volume of goods they purchase from industry  $j$ . We estimate the following relation:

$$E_{ict} = aDownstream\ Presence_{ict} + \beta X_{ct} + \delta_i + \delta_c + \delta_t + \varepsilon_{ict} \quad (5)$$

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<sup>28</sup> Note that in this case, both our variable of interest and the dependent variable are aggregated at the industry level. Regressions are weighted by number of firms.

We estimated as well a similar regression for upstream presence.

In Columns (2)-(3) and (5)-(6) of Table 5, we investigate the effect of forward and backward linkages on the creation of new domestic firms (domestic entry) and skewness of the firm-size distribution of domestic firms.<sup>29</sup> Columns (2) and (3) show positive and significant the effect of foreign presence on upstream and downstream sectors. In this case, the interquartile change in foreign ownership in upstream industries is associated with a 12% increase in entry and downstream is not significant. Columns (4) and (6) suggest the presence of foreign firms to have a significant and positive effect on the skewness of domestic downstream activities while the effect on upstream activities was not significant at standard levels. Overall, these results are broadly consistent with the evidence of vertical spillovers from FDI. Overall, although our data do not permit to correct for some of the concerns associated with cross-section analysis, our results are consistent with our previous findings.

We also find evidence from firm level spatial analysis that foreign owned firms appear to create opportunities for plant activity. Appendix C presents firm-level spatial analysis (for western European countries due to data limitations) to show that the geographic distribution of new firms is related to the distribution of foreign direct investments and that this pattern is significantly different from what we might expect of a random distribution. This effect is particularly strong between industry pairs where the foreign firms are ‘upstream’ of the new entrepreneurs suggesting that foreign investment may create opportunities for potential suppliers.

## 4.2 Capital/Credit Availability Channel

We first investigate the possibility that capital mobility affects entrepreneurship through the capital /credit availability channel. There is considerable evidence suggesting that financing constraints are important determinants of firm dynamics. We investigate whether firm activity in industries which are more reliant on external finance are positively or negatively affected by our measures of international financial integration. For each industry we proxy the dependence on external finance with the variable defined by Rajan and Zingales (1998)—the difference between investment and cash generated from operations.<sup>30</sup> In this specification our interaction term ( $Z_i \times K_c$ ) from Equation (2) is (*External Financial Dependence<sub>i</sub> × Capital Mobility<sub>c</sub>*). We run this specification across *de jure* (the IMF index) and three *de facto* measures of capital mobility. Table 6 reports comparable results for 2004.<sup>31</sup> We find

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<sup>29</sup> Note that for the industries upstream and downstream the variable is the number of foreign firms in the up/down industry weighted by the IO coefficient between the industries (which are in the range of 0.001-0.005). Hence, the coefficients between “same” (which is the number of domestic firms in the same sector) and “up” and “down” sectors are not directly comparable.

<sup>30</sup> The authors identify an industry’s need for external finance (the difference between investment and cash generated from operations) under two assumptions: (a) that U.S. capital markets, especially for the large, listed firms they analyze, are relatively frictionless enabling us to identify an industry’s technological demand for external finance; (b) that such technological demands carry over to other countries. Following their methodology, we constructed similar data for the period 1999-2007 as explained in Appendix A.

<sup>31</sup> The lower number of observations in Table 6 is due to the lack of external finance measures for some industries. We obtain similar results using 2007 data.

entrepreneurship in industries more reliant on external finance to be more sensitive to restrictions on capital mobility and more strongly affected by increased flows of finance. This result is robust to controlling for financial development proxied by domestic credit to GDP and stock market capitalization (not shown). Moreover, the magnitude of the relationship is economically significant. For example, a change in the IMF index equivalent to an increase from the 25<sup>th</sup> to the 75<sup>th</sup> percentile in our sample reduces the percentage of new firms in an industry with average levels of financial dependence (Rubber Products) by 20% over the average proportion of new firms in all industries. Similar interquartile changes for the inflows of capital and inflows of foreign investment variables are associated with increases of 26% and 29% respectively.

Our results are also consistent with the findings of Harrison et al. (2004) that incoming FDI has a significant impact on investment cash flow sensitivities for domestically owned firms and firms with no foreign assets. The authors argue that their results are in line with the hypothesis that foreign investment is associated with a greater reduction of credit constraints on firms less likely to have access to international capital markets. This is plausible because incoming foreign investment provides an additional source of capital, freeing up scarce domestic credit which can then be redirected towards domestic enterprises.

## **5 Conclusions**

Using a new plant-level data set in a broad sample of developing and developed countries, we found a positive relation between measures of capital account integration and entrepreneurial activity in a country. While reluctant to over-interpret these simple correlations, and concerns related to the data set and estimation procedures notwithstanding, there is noteworthy consistency across our different specifications and robustness tests. We also find evidence that entrepreneurial activity in industries which are more reliant on external finance is disproportionately affected by international financial integration, suggesting that foreign capital may improve access to capital either directly or through improved domestic financial intermediation. We also find evidence that FDI may create opportunities for new firms as potential suppliers to the foreign firms.

Capital market liberalization is unquestionably a controversial policy. Our results do not comment directly on the welfare issues associated with liberalization policies and are indeed consistent with many of the findings on capital account liberalization and growth. Our conclusion is strongest for direct investment and most robust in rich countries. At a minimum, the use of micro data should enhance our general understanding of the process by which the effects of liberalization are transmitted to the real economy.

## **Data Appendix A. Data Description**

### **a. The Dun and Bradstreet Data Set: Final Sample**

We use data for 1999, 2004 and 2007, excluding information lacking primary industry and year started. We excluded territories with fewer than 80 observations and those for which the World Bank provides no data (most were in Africa and had fewer than 20 firms). The final dataset covers all economic sectors (SIC) with the exception of Public Administration (Division J, group 9) and sector 43 (United States Postal Service). When we estimated mean, median, and skewness, we dropped several observations that were clearly outliers such as a firm with sales of 648.7 trillions in Denmark, a firm with sales of 219.3 trillions in Spain, a firm with sales of 219.3 billions in Spain, a firm with sales of 32.7 trillions in Germany, a firm with sales of 5,6 trillions in Lithuania, a firm with sales of 4.9 trillions in United Arab Emirates, a firm with sales of 352 billions in Nigeria, a firm with sales of 291 billions in Chad, a firm with sales of 291 billions in Angola, a firm with sales of 121 billions in Congo, and a firm with sales of 99 billions in Haiti. For 1999 the data has close to 6 million observations; 20.1 million establishments in 2004 and 23.1 million establishments in 2007. We retained data with certain information (e.g., employment) but missing other information (e.g., sales), which was the case mostly in less developed countries (Africa, in particular), our objective being to maximize the number of observations for these countries. We define foreign firms as having an uppermost parent of a corporate family located in a country different from that in which the firm operates. In terms of sample biases, we discussed with Dun & Bradstreet the possibility of over-sampling in countries with lower levels of controls or higher capital mobility (such as foreign direct investment). The firm did not seem to believe this to be a bias in its sampling strategy.

### **b. Comparing Dun & Bradstreet Data and U.S. Census Data**

To give some sense of the coverage of the Dun & Bradstreet sample used in this study, we compare our data with that collected by the U.S. Census Bureau, Statistics of U.S. Businesses. The U.S. 2001-2002 business census recorded 24,846,832 establishments.<sup>32</sup> Our data include 6,185,542 establishments (from which we exclude establishments in the total sample without the year started). About three quarters of all U.S. establishments have no payroll. Most are self-employed persons operating unincorporated businesses that might or might not be the owner's principal source of income. The U.S. census records 7,200,770 'employer establishments' with total sales of \$22 trillion. Our data include 4,293,886 establishments with more than one employee with total sales of \$17 trillion. The U.S. census records 3.7 million small employer establishments (fewer than 10 employees). Our data include 3.2 million U.S. firms with more than one and fewer than 10 employees. In our data, 6.1 percent of

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<sup>32</sup> The unit of record in the Dun & Bradstreet data is the "establishment" (a single physical location where business is conducted or services or industrial operations are performed) as opposed to a "firm" (one or more domestic establishments under common ownership or control). The U.S. census collects information on establishments as well as firms.

establishments are new.<sup>33</sup> The U.S. Census reported 12.4 percent of establishments to be new in 2001-2002, for firms with 1-4 employees this was 15.9 percent, for firms with more than 500 employees 11 percent.<sup>34</sup> Comparison by sectors (excluding a number of individual industries, such as religious organizations, certain government-owned establishments and others which are hard to map given the different classification or compare) show similar patterns.

We also compare U.S. owned subsidiaries in the WorldBase data with information on U.S. owned firms maintained by the U.S. Bureau of Economic Analysis (see [http://bea.gov/bea/di/usdop/all\\_affiliate\\_cntry.xls](http://bea.gov/bea/di/usdop/all_affiliate_cntry.xls)). The BEA's U.S. Direct Investment Abroad: Benchmark Survey, a confidential census conducted every five years, covers virtually the entire population of U.S. MNCs. Firm-level data is not readily available, but the BEA reports aggregate industry level information. In 2004, the BEA reported sales (employment) by foreign affiliates of U.S. MNCs totaling \$3,238 billion (10.02 million employees). According to D&B data for 2005, the sum of all sales (employment) by foreign establishments reporting U.S. parents was \$2,795 billion (10.07 million employees). Not only is the total similar, but the distribution across countries is also consistent.

Eric Bartelsman, John Haltiwanger, and Stefano Scarpetta, (2004) "Microeconomic Evidence of Creative Destruction in Industrial and Developing Countries." The authors have compiled from a variety of sources (including business registries, social security databases, and census- or employee-based registries) a data set on firms across broad sectors and various countries for the 1990s. Years and sources differ across countries depending on availability. The data is available for few (mostly industrialized) countries and for many countries the data are confidential. Because the information in our data set is out of their sample period, we cannot directly compare the data. It is also hard to compare because of differences in the coverage. Overall, broad comparisons illustrate that our data set seems to be well suited to our analysis.

### **c. Variable Description and Sources**

#### *List of Countries*

Algeria, Angola, Argentina, Australia, Austria, Belgium, Bolivia, Bosnia-Herzegovina, Brazil, Bulgaria, Burkina-Faso, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Etiopía, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea South, Kuwait, Latvia, Lebanon, Lithuania, Madagascar, Malaysia, Mauritius, Mexico, Morocco, Mozambique, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, Spain, Sudan, Sweden, Switzerland, Syria, Tanzania,

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<sup>33</sup> We define as new an establishment having a year started date less than two years previous.

<sup>34</sup> Establishment and Employment Changes from Births, Deaths, Expansions, and Contractions, [http://www.census.gov/csd/susb/usst01\\_02.xls](http://www.census.gov/csd/susb/usst01_02.xls).

Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, Uganda, United Arab Emirates, United Kingdom, Uruguay, USA, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

#### *Dependent Variables*

Firm Level Data: From Worldbase - Dun & Bradstreet. In the analysis, we use 2 digit SIC-1987. Data for 1999, 2004, 2007.

Skewness: Skewness of the firm employment distribution for each country/industry pair.

Size: (Log) of the average number of employees for each country/industry pair.

Entry: Number new firms (less than two years) divided by the total number of firms in the country/industry pair. We also calculate domestic new firms (the ration of domestically-owned new firms to total domestic firms).

Age: Average age of the firms in each country/industry pair.

Vintage: Weighted average of the age of the firms in each industry/country pair, the weights being the total number of employees.

#### *Independent Variables*

IMF's Capital Account Liberalization Index: From the IMF's Annual Report on Exchange Arrangements and Exchange Restriction (AREAER). The index considers controls to: capital market securities; money market instruments; collective investment securities; derivatives and other instruments; commercial credits; financial credits; guarantees, securities and financial backup facilities; direct investment; real estate transactions; personal capital transactions. For each indicator, a corresponding dummy variable takes the value of one if the restriction is present in the country. The index is the average of the dummies.

Capital Inflows/GDP: From the IMF, International Financial Statistics. Capital Inflows are the sum of FDI, equity portfolio, debt and derivative flows. FDI: direct investment in reporting economy (line 78bed). Portfolio equity investment: equity security liabilities (line 78bmd). Derivative flows: financial derivative liabilities (line 78bxd). Debt flows: debt security liabilities (line 78bnd) and other investment liabilities (line 78bid). Data is calculated as a percentage of GDP in U.S. dollars (taken from the World Bank, World Development Indicators).

Inflows of Foreign Direct Investment/GDP: From the World Bank, World Development Indicators. FDI to GDP are inet inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital.

Macroeconomic Data: From the World Bank, World Development Indicators: (Log) GDP, (Log) GDP per capita, growth real GDP, volatility of growth (standard deviation of gdp growth for 2000-2004 divided by the period's mean), inflation (percent growth in the CPI), M3/GDP, domestic credit to GDP, stock market capitalization to GDP, trade (exports plus imports over GDP). From the Economist

Intelligence Unit: growth forecasts. Size of the informal sector as percentage of GDP in year 2000, from Schneider (2002).

Institutional Quality: From the International Country Risk Guide (ICRG), a monthly publication of Political Risk Services. Non-corruption (assessment of corruption within the political system; average yearly rating from 0 to 6, where a higher score means lower risk). Law and order (the law subcomponent is an assessment of the strength and impartiality of the legal system; the order sub-component is an assessment of popular observance of the law; average yearly rating from 0 to 6, where a higher score means lower risk). Bureaucratic quality (institutional strength and quality of the bureaucracy; average yearly rating from 0 to 4, where a higher score means lower risk.).

Regulation: From the World Bank, World Development Indicators: number of days required to start a business; business disclosure index (0=less disclosure to 7=more disclosure); legal rights of borrowers and lenders index (0=less credit access to 10=more access).

Dependence on External Finance: Constructed by authors for 1999-2006 following Rajan and Zingales (1998). An industry's external financial dependence is obtained by calculating the external financing of U.S. companies using data from Compustat calculated as:  $(\text{Capex}-\text{Cashflow})/\text{Capex}$ , where Capex is defined as capital expenditures and Cashflow is defined as cash flow from operations. Industries with negative external finance measures have cash flows that are higher than their capital expenditures.

#### **d. Industry Codes: Standard Industrial Classification (SIC) - 1987 Version**

A. Agriculture, Forestry, and Fishing: 01: Agricultural Production Crops; 02: Agriculture production livestock and animal specialties; 07: Agricultural Services; 08: Forestry; 09: Fishing, hunting, and trapping. B. Mining: 10: Metal Mining; 12: Coal Mining; 13: Oil and Gas Extraction; 14: Mining and Quarrying Of Nonmetallic Minerals, Except Fuels. C. Construction: 15: Building Construction General Contractors and Operative Builders; 16: Heavy Construction Other Than Building Construction Contractors; 17: Construction Special Trade Contractors. D. Manufacturing: 20: Food and Kindred Products; 21: Tobacco Products; 22: Textile Mill Products; 23: Apparel and Other Finished Products Made From Fabrics and Similar Materials; 24: Lumber and Wood Products, Except Furniture; 25: Furniture and Fixtures; 26: Paper and Allied Products; 27: Printing, Publishing, and Allied Industries; 28: Chemicals and Allied Products; 29: Petroleum Refining and Related Industries; 30: Rubber and Miscellaneous Plastics Products; 31: Leather and Leather Products ; 32: Stone, Clay, Glass, And Concrete Products; 33: Primary Metal Industries; 34: Fabricated Metal Products, Except Machinery And Transportation Equipment; 35: Industrial And Commercial Machinery And Computer Equipment; 36: Electronic and Other Electrical Equipment And Components, Except Computer Equipment; 37: Transportation Equipment; 38: Measuring, Analyzing, and Controlling Instruments; Photographic, Medical And Optical Goods; Watches and Clocks; 39: Miscellaneous Manufacturing Industries. E. Transportation, Communications, Electric, Gas, And Sanitary Services: 40: Railroad Transportation; 41:



Local and Suburban Transit and Interurban Highway Passenger Transportation; 42: Motor Freight Transportation and Warehousing; 44: Water Transportation; 45: Transportation by Air; 46: Pipelines, Except Natural Gas; 47: Transportation Services; 48: Communications; 49: Electric, Gas, and Sanitary Services. F. Wholesale Trade: 50: Wholesale Trade-durable Goods; 51: Wholesale Trade-non-durable Goods. G. Retail Trade: 52: Building Materials, Hardware, Garden Supply, and Mobile Home Dealers; 53: General Merchandise Stores; 54: Food Stores; 55: Automotive Dealers And Gasoline Service Stations; 56: Apparel And Accessory Stores; 57: Home Furniture, Furnishings, And Equipment Stores; 58: Eating And Drinking Places; 59: Miscellaneous Retail. H. Finance, Insurance, and Real Estate: 60: Depository Institutions; 61: Non-depository Credit Institutions; 62: Security and Commodity Brokers, Dealers, Exchanges, and Services; 63: Insurance Carriers; 64: Insurance Agents, Brokers, and Service; 65: Real Estate; 67: Holding and Other Investment Offices. I. Services: 70: Hotels, Rooming Houses, Camps, And Other Lodging Places; 72: Personal Services; 73: Business Services; 75: Automotive Repair, Services, and Parking; 76: Miscellaneous Repair Services; 78: Motion Pictures; 79: Amusement And Recreation Services; 80: Health Services; 81: Legal Services; 82: Educational Services; 83: Social Services; 84: Museums, Art Galleries, And Botanical And Zoological Gardens; 86: Membership Organizations; 87: Engineering, Accounting, Research, Management, and Related Services; 88: Private Households; 89: Miscellaneous Services.

## **Appendix B. Robustness Checks**

We performed additional robustness checks on the regressions results in (1). Table B1 presents the results of equation (1) using skewness as proxy for entrepreneurship and the IMF index and capital inflows in columns, as measures of international financial integration. The table shows the significance of the coefficient of the capital mobility measures to be relatively stable across specifications which consider different main controls. We obtain similar results using the other measure of entrepreneurship and proxies for international financial integration.

Columns (1)-(2) in Table B2 show our results to be robust to using as additional proxies for entrepreneurship: firm age and firm vintage. An additional concern is that our results may be driven by considering establishments as the unit record. Column (3), however, shows our results robust to using only wholly owned firms when calculating our entrepreneurship measures (the table shows skewness results). That is, we exclude from the sample establishments that report to domestic parents. Our results were similar when considering domestic parents and subsidiaries as a single entity and using other the measures of entrepreneurship.

Another concern is that our results may be driven by different sampling intensities in different countries. It might be the case, for example, that countries with higher sampling intensity have disproportionately more small firms. Column (1) in Table B3, which controls for the number of firms sampled in each country, suggests this not to be the case. As mentioned, our results are also weighted. In

addition, table B3 shows our results to be robust to using only the manufacturing sector in column (2), only rich countries in column (3), excluding the United States from the sample in column (4), and adding regional dummies in column (5), inflation in (6) and trade in (7).

Table B4 performs additional robustness using other controls for financial development such as market capitalization to GDP in column (1) and M3 to GDP in (2). In column (3) we use inflation as a measure of macroeconomic instability. Our results are robust to the inclusion of the value of the trade openness defined as the sum of exports and imports as a share of output. in the last column in (4). Controlling for the (the log) of population (as an alternative proxy for scale) and for education levels (share of primary school) yielded similar results (not shown). As another imperfect attempt to account for possible endogeneity biases, we used institution-based instruments for financial integration from La Porta et al. (1998) which have been used in the literature for international financial liberalization and domestic financial development. Criticism of these instruments notwithstanding, overall the IV regression did not contradict the conclusions drawn from the OLS regressions.

Table B5 includes additional robustness. We limit the analysis to 1999 and 2004 since the coverage for many variables in 2007 was limited (in order to maintain a common sample for a wide series of indicators). As the table shows, our main results are robust to controlling for other measures of regulation, financial development and macro economic conditions. In columns (1)-(3), we control for indices of borrowers' and lenders' rights and business disclosure from the World Bank as additional proxies for regulation, and stock market capitalization as proxies for financial development. Data for 'days to start a business' from World Bank, World Development Indicators is not available for 1999. We tested our results using the 2004 data in a cross section analysis obtaining similar results. Column (4) controls for inflation while column (5) uses GDP volatility. In columns (6) we use the EIU growth forecasts as an imperfect measure of exogenous growth opportunities. As shown in column (7), we add trade and in column (8) controls the share of the informal sector in the economy obtaining similar results (these data, however, were available for a wide range of countries for 2000 only).

### **Appendix C. Firm Level Spatial Analysis**

We investigate the relationship between foreign firms and entrepreneurs at the firm level using spatial analysis. We develop a distance-based test to determine whether foreign firms crowd out or create opportunities for new firms. Our methodology is based on the fact that domestic and foreign firms have different characteristics which may differentially affect other firms in their region and second that the effect of those characteristics on other firms attenuates with distance.

A considerable literature has established that domestic and foreign firms are different and that they may exert different externalities on the firms around them.<sup>35</sup> Multinational firms may embody more technology than their domestic counterparts and are more likely introduce new products or processes

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<sup>35</sup> For a survey see Barba-Navarett and Venables (2004).

which benefit the accelerated diffusion of new technology. If the benefits from foreign ownership are not entirely internalized then domestic firms stand to gain from the presence of foreign firms. Alternatively the entry of a multinational firm might simply crowd out national firms competing away their market shares and forcing them up their cost curves, or by bidding up the prices of inputs. A second literature in regional economics has recognized that strength of the interaction between firms is not neutral with respect to distance.<sup>36</sup> Combining the insight that foreign and domestic firms exert different externalities with the possibility that these externalities attenuate with distance gives rise to a spatial methodology with which to examine the effect of foreign firms on domestic entrepreneurship.

#### **a. Construction of Variables and Significance Tests**

For each industry  $s$  we classify our firms into three types: “foreign” firms if they report a foreign owner in 2004, “new” if they are less than two years old and do not have a foreign parent, and “domestic” if they satisfy neither of these criteria. We restrict our attention in this section to data for manufacturing industries in UK, Spain, France, and Germany due to limitations on our access to geocoded postcode information for a large number of countries at reasonable cost Western European countries. From the Dun and Bradstreet data, we have for each establishment a post code address which is the physical address of the business. We match the postcode information for each establishment<sup>37</sup> with latitude/longitude co-ordinates<sup>38</sup> enabling us to locate each establishment at the centre of each post code and also to describe the distance between establishments as the great-circle distance between postcodes.<sup>39</sup> Let the number of foreign firms in the industry be  $N_f$ . For new firm,  $i$ , in each industry,  $s$ , we calculate the bilateral distance  $d_{ijs}$  to every foreign firm,  $j$ . We calculate an average distance,  $d_{is}$ , for each new firm excluding distances over 100km.<sup>40</sup> In our furniture example the average distance between new and foreign firms is 25.6km.

A key requirement of spatial analysis is that we be able to say something about its statistical significance. We do this by testing how the average distance between new firms and foreign firms differs from some counterfactual which we construct by considering the properties of a random entry pattern. In a random counterfactual our entrants would locate no differently whether the firms were foreign or domestically owned. To mimic this we create a control group of firms which includes all the foreign firms and a group of matched domestic firms in the industry. We randomly draw, without replacement,  $N_f$

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<sup>36</sup> A number of studies have considered the effect of the geographic distribution of incumbents on the establishment and performance of new firms. Rosenthal and Strange (2003) find evidence that firm entry is more likely near concentrations of existing employment in the same industry, see also Ciccone and Hall (1996).

<sup>37</sup> Dun and Bradstreet reports the physical location of the establishment rather than a registered address.

<sup>38</sup> In the UK this comes from the All Fields Postcode Directory, for other countries it was supplied by MapMechanics. The maximum error is the distance from the centre of the postcode to its extremity, which in the UK is less than 100m for 99% of establishments, and a maximum of a few kilometers for other countries.

<sup>39</sup> The formula for the great-circle distances between the two points, i.e. the shortest distance over the earth’s surface, using the ‘Haversine’ formula is  $\text{distance}(1,2) = \text{acos}(\sin(\text{lat}1) \cdot \sin(\text{lat}2) + \cos(\text{lat}1) \cdot \cos(\text{lat}2) \cdot \cos(\text{long}2 - \text{long}1))$ .

<sup>40</sup> For computational ease and since the effect of firms is expected to attenuate over distance.

firms from this control group. This is equivalent to randomly re-labelling all the firms as either domestic or foreign while holding the share of both groups constant.

Determining matching criteria for our control group requires us to consider which qualities of foreign firms we are analysing. As discussed above, foreign firms are different to domestic firms along various dimensions including size, productivity, innovation, wage rates, linkages with domestic suppliers, etc. Our method of constructing a counterfactual from a pool of foreign and domestic firms essentially involves differencing out the effect of one set of characteristics on which the matching is based, and identifying across the remainder. Our objective is to understand the aggregate effect of foreign firms so we use a parsimonious matching criteria which does not control for any firm characteristics except those required to ensure that our counterfactual pool has the same industry mix, size and age profile. Accordingly we match our firms only on three characteristics: SIC code (to control for differences across industries), age (to ensure that our results are not affected by endogenous time varying location characteristics), and size (to control for scale). We use exact matching techniques to match each domestic firm with one foreign firm. In order to qualify as a match the domestic firm must be in the same industry as the foreign firm, its year of establishment (the first date it operated under its current ownership in that location) must be within +/- two years and its number of employees must be no more than +/- 10 percent of its counterpart. Using these criteria we find an average of 2.7 domestic firms per foreign firm. This gives us a total pool across all our industries of 41,921 foreign firms and 155,108 domestic firms. Table C1 indicates that the differences between our foreign firms and control group are small (by construction).

Using these firms we run 1000 simulations, each time drawing  $N_f$  firms in each industry from the control group and calculating the average distance between new firms and these draws. Our confidence interval for the mean distance between new and foreign firms is constructed such that only 5% of our counterfactual mean distances between new firms and randomly selected control firms are above or below the upper and lower bound.

## **b. Spatial Results**

Our question is whether the location patterns of new firms are essentially a random allocation with respect to the ownership of existing firms. We dropped 268 industries (out of 956 industries—239 industries in four countries) because they had less than 10 new firms or less than 10 foreign firms in any country. We find that the average distance from a new firm to a foreign firm in the same industry is 23.3 km. Several conclusions emerge with respect to four-digit industries: (i) our average distance between new firms and foreign firms in the same industry is 23.3 Kms, (ii) this is greater than the average distance from our Monte Carlo simulations drawing at random from a pool of foreign and domestic firms (25.2). (iii) The 5th percentile of the mean of these counterfactual draws is 24 Kms (the 8th percentile corresponds to 23.3). Thus for firms in the same industry we conclude that while the average distance between new and foreign firms is larger than the distance from counterfactuals, we cannot say that it differs from what might be produced from a random allocation at the 5% level of significance. However

our results are stronger when we consider relationships between industries. Following our methodology in the previous section, for each industry we use input-output matrices to identify the 5 paired industries for which the input output coefficient is greatest. For example, SIC 2262 Finishers of Broadwoven Fabrics of Manmade Fiber and Silk is a key input of 2392 House furnishing, Except Curtains and Draperies. When considering these vertically industries we find that our mean distance between new firms (26.4) corresponds to the 2nd percentile in the counterfactual distribution. This is consistent with recent work has considered the positive effects of FDI on domestic enterprise through backward and forward linkages, showing that foreign firms may foster the development of domestic firms in the host country (see Javorcik, 2004). We find that the creation of new firms is particularly responsive to the geographic distribution of foreign firms in downstream industries, suggesting that foreign firms create opportunities for new firms in their supply chain and consistent with our previous findings.

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Table 1: Country Entrepreneurship Data: Summary Statistics—1999, 2004 & 2007

	Mean	Std Dev	Min.	Max.
Entry	3.3	6.6	0.0	23.0
Empl.	66.8	14435.5	1.0	11563.0
Age	17.9	10.0	1.0	107.0
Skewness Empl.	7.8	17.4	-1.9	437.3
Bureaucratic Quality	2.7	1.0	0.0	4.0
Non-Corruption	3.0	1.3	0.0	6.0
Law and Order	4.2	1.3	1.0	6.0
IMF Index	67.4	51.7	2.0	222.3
Capital Inflows/GDP	14.2	22.6	-47.6	188.0
FDI Inflows/GDP	4.9	7.7	-15.1	92.7
Domestic Credit/GDP	61.5	42.5	2.1	279.9
Stock Market Cap./GDP	66.5	59.0	0.0	471.2

Notes: Summary statistics correspond to D&B Data Set for 1999, 2004 and 2007. Counts do not consider SIC 9 (public sector) and industry 43. Entry corresponds to the percentage of new firms to total firms. See Appendix A for detailed data description.

Table 2: Correlation for Main Variables—1999, 2004, &amp; 2007

	Entry	Age	Vintage	Empl.	Skew. Empl.	IMF Index	Capital Inflows	FDI Inflows	Log GDP	Log GDPpc	GDP Growth	Non-Corrupt.	Law and Order	Bureau. Qual.	Domestic Credit	# Firms
Entry	1.000															
Age	-0.368	1.000														
Vintage	-0.284	0.791	1.000													
Empl.	-0.125	0.215	0.713	1.000												
Skew. Empl.	0.110	-0.058	-0.269	-0.418	1.000											
IMF Index	-0.232	-0.049	0.033	0.107	-0.186	1.000										
Capital Inflows	-0.021	0.039	-0.090	-0.173	0.098	-0.069	1.000									
FDI Inflows	0.027	-0.210	-0.136	-0.004	-0.077	0.024	-0.040	1.000								
Log GDP	0.046	0.071	-0.146	-0.300	0.385	0.043	0.115	-0.274	1.000							
Log GDPpc	0.079	0.004	-0.335	-0.555	0.378	-0.169	0.404	-0.043	0.594	1.000						
GDP Growth	-0.060	-0.098	0.179	0.405	-0.310	0.190	-0.128	0.120	-0.344	-0.453	1.000					
Non-Corrupt.	0.086	0.025	-0.290	-0.512	0.353	-0.146	0.290	-0.022	0.424	0.739	-0.432	1.000				
Law and Order	0.109	-0.067	-0.289	-0.409	0.293	-0.080	0.391	-0.030	0.418	0.693	-0.326	0.729	1.000			
Bureau. Qual.	0.022	0.043	-0.269	-0.492	0.342	-0.087	0.381	-0.062	0.565	0.817	-0.472	0.784	0.692	1.000		
Domestic Credit	0.070	0.061	-0.250	-0.464	0.355	-0.095	0.431	-0.096	0.584	0.734	-0.455	0.710	0.706	0.726	1.000	
# Firms	0.057	-0.043	-0.167	-0.253	0.491	-0.045	0.024	-0.056	0.296	0.214	-0.155	0.157	0.135	0.173	0.232	1.000

Notes: See Appendix A for detailed data description.

Table 3a: Entrepreneurship and Capital Mobility I—1999, 2004, & 2007 (Tobit/Weighted)  
 Dependent Variable: Entrepreneurship—Entry

	Capital Mobility measured as		
	<i>De Jure</i> IMF Index (1)	<i>De Facto</i> Capital Inflows/GDP (2)	<i>De Facto</i> FDI Inflows/GDP (3)
Capital Mobility	-3.187 [0.190]***	0.018 [0.003]***	0.114 [0.013]***
Log GDP	0.455 [0.106]***	0.425 [0.100]***	0.623 [0.101]***
Log GDP per capita	0.431 [0.194]**	5.585 [0.347]***	5.390 [0.335]***
GDP Growth	0.030 [0.023]	0.355 [0.032]***	0.275 [0.030]***
Non-Corruption	0.127 [0.082]	0.708 [0.067]***	0.796 [0.065]***
Law and Order	0.458 [0.075]***	1.634 [0.100]***	1.749 [0.094]***
Bureaucratic Quality	-0.797 [0.119]***	-4.004 [0.131]***	-4.254 [0.127]***
Domestic Credit/GDP	-0.001 [0.002]	-0.001 [0.001]	0.000 [0.001]
# Observations	11148	10313	11025

*Notes:* All regressions include, country, industry dummies, and time dummies and are estimated using Tobit. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the number of new firms relative to all firms in the country/industry pair. The capital mobility variable corresponds to IMF index in (1); Capital Inflows/GDP in (2); FDI Inflows/GDP in (3). GDP data, Domestic Credit/GDP come from WB, WDI. Bureaucratic Quality, Non-corruption and Law and Order from ICRG. See Appendix A for detailed description of the data.

Table 3b: Entrepreneurship and Capital Mobility II— 1999, 2004 & 2007 (OLS/Weighted)  
 Dependent Variable: Entrepreneurship—Size (Log of Employment)

	Capital Mobility measured as		
	<i>De Jure</i> IMF Index (1)	<i>De Facto</i> Capital Inflows/GDP (2)	<i>De Facto</i> FDI Inflows/GDP (3)
Capital Mobility	0.151 [0.008]***	-0.037 [0.005]***	-0.042 [0.004]***
Log GDP	0.190 [0.008]***	0.220 [0.008]***	0.281 [0.008]***
Log GDP per capita	-1.331 [0.028]***	-1.407 [0.031]***	-1.541 [0.028]***
GDP Growth	0.017 [0.002]***	-0.002 [0.003]	0.001 [0.002]
Non-Corruption	-0.140 [0.005]***	-0.112 [0.005]***	-0.087 [0.005]***
Law and Order	0.043 [0.007]***	0.075 [0.008]***	0.077 [0.008]***
Bureaucratic Quality	0.560 [0.010]***	0.550 [0.012]***	0.498 [0.011]***
Domestic Credit/GDP	-0.001 [0.002]	-0.001 [0.001]	0.000 [0.001]
R <sup>2</sup>	0.58	0.57	0.57
# Observations	13541	12633	13417

Notes: All regressions include country, industry, and time dummies and are estimated by OLS with White's correction of heteroskedasticity and corrected at the country level (clustering). Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the skewness of the employment distribution. The capital mobility variable corresponds to IMF index in (1); Capital Inflows/GDP in (2); FDI Inflows/GDP in (3). GDP data, Domestic Credit/GDP come from WB, WDI. Bureaucratic Quality, Non-corruption and Law and Order from ICRG. See Appendix A for detailed description of the data.

Table 3c: Entrepreneurship and Capital Mobility III—1999, 2004 & 2007 (OLS/Weighted)  
 Dependent Variable: Entrepreneurship—Skewness of Employment

	Capital Mobility measured as		
	<i>De Jure</i> IMF Index (1)	<i>De Facto</i> Capital Inflows/GDP (2)	<i>De Facto</i> FDI Inflows/GDP (3)
Capital Mobility	-1.175 [0.315]***	0.087 [0.032]***	0.696 [0.190]***
Log GDP	-1.894 [0.290]***	8.804 [1.163]***	27.445 [1.753]***
Log GDP per capita	17.582 [1.047]***	8.508 [4.316]**	13.686 [5.993]**
GDP Growth	-0.824 [0.100]***	3.461 [0.361]***	-4.926 [0.516]***
Non-Corruption	2.987 [0.194]***	5.034 [0.735]***	29.997 [1.098]***
Law and Order	-3.029 [0.273]***	5.161 [1.090]***	-5.204 [1.660]***
Bureaucratic Quality	-8.919 [0.418]***	-15.890 [1.630]***	-33.829 [2.267]***
Domestic Credit/GDP	0.012 [0.004]***	-0.148 [0.014]***	-0.377 [0.022]***
R <sup>2</sup>	0.38	0.30	0.30
# Observations	10946	10466	10855

Notes: All regressions include country, industry, and time dummies and are estimated by OLS with White's correction of heteroskedasticity and corrected at the country level (clustering). Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the skewness of the employment distribution. The capital mobility variable corresponds to IMF index in (1); Capital Inflows/GDP in (2); FDI Inflows/GDP in (3). GDP data, Domestic Credit/GDP come from WB, WDI. Bureaucratic Quality, Non-corruption and Law and Order from ICRG. See Appendix A for detailed description of the data.

Table 4: Entrepreneurship and Capital Mobility—Benchmark - U.S. 1999, 2004 & 2007  
 Dependent Variable: Entrepreneurship—Various Measures

Dependent Variable	Entry	Skew.	Entry	Skew.	Entry	Skew.
	Tobit	OLS	Tobit	OLS	Tobit	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
New Firms in US x IMF Index	-0.195 [0.040]***					
Skewness Firms in US x IMF Index		-0.002 [0.007]				
New Firms in US x Inflows/GDP			0.004 [0.001]***			
Skewness Firms in US x Inflows/GDP				0.002 [0.000]***		
New Firms in US x FDI Inflows/GDP					0.016 [0.003]***	
Skewness Firms in US x FDI Inflows/GDP						0.003 [0.000]***
R <sup>2</sup>		0.36		0.28		0.26
Observations	12030	8607	10694	10669	11707	11254

Notes: All regressions include country and industry dummies and are estimated by OLS with White's correction of heteroskedasticity. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. In (1), (3), (5) the dependent variable is entry of new firms; in (2), (4), (6), the skewness of the employment distribution. See Appendix A for detailed description of the data.

Table 5: Channels I—FDI:  
Effects of Foreign Firms' Activity on Same, Upstream, and Downstream Industries 2004 (Weighted)  
Dependent Variable: Domestic Entrepreneurship

Dependent Variable:	Entrepreneurial Activity in					
	Same Industry	Upstream Industries	Downstream Industries	Same Industry	Upstream Industries	Downstream Industries
	Domestic Entry (Tobit)			Domestic Skewness (OLS)		
	(1)	(2)	(3)	(4)	(5)	(6)
Foreign Firms	0.270 [0.027]**	3.060 [3.169]**	3.555 [2.475]	0.523 [0.116]**	2.009 [0.193]**	2.595 [8.264]
Log GDP	1.468 [0.080]**	0.420 [0.062]**	0.510 [0.095]***	4.518 [0.650]**	5.052 [0.853]**	4.994 [0.846]**
Log GDP per capita	1.207 [0.146]**	0.246 [0.213]	-0.054 [0.175]	1.611 [0.917]*	0.476 [1.272]	0.346 [1.236]
GDP Growth	0.198 [0.044]**	0.082 [0.039]**	-0.072 [0.059]	-0.389 [0.333]	1.352 [0.386]**	1.306 [1.375]**
Bureaucratic Quality	1.041 [0.209]**	1.672 [0.183]**	1.113 [0.278]***	1.003 [1.239]	0.387 [1.909]	0.073 [1.823]
Non-Corruption	1.200 [0.122]**	0.625 [0.081]**	0.996 [0.127]***	1.010 [0.961]	1.460 [0.936]	1.583 [0.871]*
Law and Order	0.388 [0.109]**	-0.095 [0.094]	-0.239 [0.147]	0.564 [0.775]	0.867 [1.000]	0.813 [0.983]
Domestic Credit/GDP	0.005 [0.003]*	0.013 [0.002]**	0.012 [0.003]***	0.055 [0.019]**	0.091 [0.042]**	0.093 [0.042]**
R <sup>2</sup>				0.35	0.38	0.38
# Observations	7255	4244	4453	5866	4747	4384

Notes: All regressions include country, industry and time dummies and are estimated by OLS in columns (1)-(3) and Tobit in columns (4)-(6) with White's correction for heteroskedasticity. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. In columns (1)-(3), the dependent variable is the skewness of the employment distribution of domestic firms; in columns (4)-(6) entry of new domestic firms. For the "same industry," foreign firms are the share of foreign firms to total firms. For the industries upstream and downstream the variable is the number of foreign firms in the up/down industry weighted by the I.O. coefficient between the industries. GDP data, Domestic Credit to GDP are from WB, WDI, Bureaucratic Quality, Non-corruption and Law and Order from ICRG. See Appendix A for a detailed description of the data.

Table 6: Channels II—Financial Dependence 2004 (Weighted)  
 Dependent Variable: Entrepreneurship—Various Measures

Dependent Variable	Entry	Skew.	Entry	Skew.	Entry	Skew.	Entry	Skew.	Entry	Skew.
	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
External Fin. Dep. x IMF Index	-4.840 [0.059]***	-5.270 [1.572]**								
External Fin. Dep. x Inflows/GDP			0.334 [0.021]***	0.110 [0.032]**						
External Fin. Dep. x FDI Inflows/GDP					1.420 [0.211]***	-0.049 [0.034]				
External Fin. Dep. x Foreign Liabilities/GDP							0.050 [0.020]**	-0.041 [0.003]***		
External Fin. Dep. x Gross Flows/GDP									0.050 [0.001]**	0.027 [0.039]
R <sup>2</sup>		0.69		0.40		0.40		0.40		0.41
# Observations	5083	4629	4382	4102	5730	4533	4054	3146	4724	3903

Notes: All regressions include country and industry dummies and are estimated by OLS with White's correction of heteroskedasticity. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. In (1), (3), (5), (7) the dependent variable is entry of new firms; in (2), (4), (6), (8) the skewness of the employment distribution. See Appendix A for detailed description of the data.



Table B1: Robustness I—Entrepreneurship and Capital Mobility—1999, 2004 & 2007 (OLS/Weighted)  
Dependent Variable: Entrepreneurship—Skewness

	Capital Mobility measured as					
	IMF Index			Capital Inflows/GDP		
	(1)	(2)	(2)	(3)	(5)	(6)
Capital Mobility	-6.299 [1.410]***	-5.868 [1.435]***	-1.175 [0.315]***	0.099 [0.044]**	0.204 [0.038]**	0.087 [0.032]***
Log GDP		-1.490 [0.995]***	-1.894 [0.290]***		13.265 [1.161]***	8.804 [1.163]***
Log GDP per capita		17.474 [3.093]***	17.582 [1.047]***		18.107 [3.464]***	8.508 [4.316]**
GDP Growth		-5.078 [0.412]***	-0.824 [0.100]***		-8.589 [0.457]***	3.461 [0.361]***
Non-Corruption			2.987 [0.194]***			5.034 [0.735]***
Law and Order			-3.029 [0.273]***			5.161 [1.090]***
Bureaucratic Quality			-8.919 [0.418]***			-15.89 [1.630]***
Domestic Credit/GDP			0.012 [0.004]***			-0.148 [0.014]***
R <sup>2</sup>	0.30	0.33	0.38	0.18	0.23	0.30
# Observations	11538	11257	10946	10740	10740	10855

Notes: All regressions include country, industry, and time dummies and are estimated by OLS with White's correction of heteroskedasticity and corrected at the country level (clustering). Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the skewness of the employment distribution. The capital mobility variable corresponds to IMF index and Capital Inflows/GDP. GDP, Domestic Credit to GDP data come from WB, WDI. Bureaucratic Quality, Non-corruption and Law and Order from ICRG. See Appendix A for detailed description of the data.

Table B2: Robustness II—Entrepreneurship and Capital Mobility—1999, 2004 & 2007 (OLS/Weighted)  
 Dependent Variable: Entrepreneurship—Various Measures

Dependent Variable	Age	Vintage	Skewness- Wholly Owned Firms
	OLS (1)	OLS (2)	OLS (3)
IMF Index	0.635 [0.066]***	0.188 [0.002]***	-58.147 [1.475]***
Log GDP	-0.606 [0.069]***	0.297 [0.002]***	21.406 [1.519]***
Log GDP per capita	4.176 [0.253]***	2.162 [0.009]***	12.912 [5.537]**
GDP Growth	-0.557 [0.022]***	-1.050 [0.001]***	-1.630 [0.479]***
Non-Corruption	0.038 [0.045]	-1.157 [0.001]***	15.925 [0.993]***
Law and Order	-1.686 [0.065]***	-0.842 [0.002]***	-12.612 [1.416]***
Bureaucratic Quality	0.990 [0.101]***	3.382 [0.003]***	-13.460 [2.202]***
Domestic Credit to GDP	0.009 [0.001]***	0.009 [0.000]***	-0.144 [0.019]***
R <sup>2</sup>	0.79	0.73	0.41
# Observations	13541	12735	10946

Notes: All regressions include country, industry, and time dummies and are estimated by OLS with White's correction for heteroskedasticity and corrected at the country level (clustering), except for entry regressions, which are estimated by Tobit and are not clustered. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable is age in (1); vintage in (2); skewness of employment of wholly owned firms in (3). GDP data, Domestic Credit to GDP come from WB, WDI, Bureaucratic Quality, Non-corruption, and Law and Order from ICRG. See Appendix A for a detailed description of the data.

Table B3: Robustness III—Entrepreneurship and Capital Mobility—1999, 2005 & 2007 (Tobit/Weighted)  
 Dependent Variable: Entrepreneurship—Entry

	All (1)	Only Manuf. (2)	Only Rich Countries (3)	Non-U.S. (4)	Regional Dummies (5)
IMF Index	-5.330 [0.090]***	-3.359 [0.138]***	-5.295 [0.089]***	-6.309 [0.100]***	-5.422 [0.090]***
Log GDP	0.513 [0.109]***	0.619 [0.123]***	0.360 [0.096]***	0.541 [0.105]***	0.457 [0.095]***
Log GDP per capita	5.799 [0.336]***	3.157 [0.379]***	5.646 [0.332]***	6.399 [0.323]***	4.429 [0.333]***
GDP Growth	0.330 [0.031]***	0.426 [0.039]***	0.306 [0.029]***	0.559 [0.035]***	0.210 [0.029]***
Non-Corruption	0.662 [0.065]***	0.864 [0.091]***	0.690 [0.064]***	1.534 [0.077]***	0.579 [0.064]***
Law and Order	1.840 [0.096]***	0.752 [0.118]***	1.774 [0.094]***	1.154 [0.099]***	1.982 [0.093]***
Bureaucratic Quality	-4.166 [0.128]***	-2.395 [0.172]***	-4.094 [0.125]***	-4.719 [0.127]***	-3.731 [0.125]***
Domestic Credit/GDP	-0.002 [0.001]	-0.001 [0.002]	-0.001 [0.001]	-0.002 [0.001]*	0.000 [0.001]
Sampling Intensity	-0.100 [0.034]***				
# Observations	11148	3099	11148	11001	11000

Notes: All regressions include country, industry, and time dummies and are estimated by Tobit with White's correction for heteroskedasticity. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the skewness of the employment distribution. The capital mobility variable corresponds to the IMF index. Regression (1) controls for sampling intensity; (2) is for the manufacturing sector only, (3) is for industrialized countries only, (4) excludes the United States from the sample, (5) includes regional dummies (not shown). GDP data, Domestic Credit to GDP come from WB, WDI, Bureaucratic Quality, Non-corruption, and Law and Order from ICRG. See Appendix A for a detailed description of the data.

Table B4: Robustness IV—Entrepreneurship and Capital Mobility—1999, 2005 & 2007 (Tobit/Weighted)  
 Dependent Variable: Entrepreneurship—Entry

	All (1)	All (2)	All (3)	All (4)
IMF Index	-3.403 [0.185]***	-2.683 [0.231]***	-4.258 [0.083]***	-5.422 [0.090]***
Log GDP	0.495 [0.102]***	0.317 [0.121]***	0.515 [0.087]***	0.457 [0.095]***
Log GDP per capita	0.551 [0.194]***	0.750 [0.212]***	1.257 [0.284]***	4.429 [0.333]***
GDP Growth	-0.029 [0.025]	0.035 [0.025]	0.292 [0.024]***	0.210 [0.029]***
Non-Corruption	0.056 [0.085]	-0.318 [0.107]***	0.703 [0.053]***	0.579 [0.064]***
Law and Order	0.578 [0.079]***	0.468 [0.081]***	0.764 [0.090]***	1.982 [0.093]***
Bureaucratic Quality	-1.000 [0.132]***	-0.807 [0.133]***	-0.134 [0.128]	-3.731 [0.125]***
Domestic Credit/GDP	-0.003 [0.002]	0.014 [0.003]***	0.003 [0.001]	0.003 [0.001]
Market Cap/GDP	0.002 [0.001]			
M3/GDP		-0.001 [0.003]		
Inflation			0.112 [0.348]	
Trade				0.321 [0.216]
# Observations	9341	9254	10362	9982

Notes: All regressions include country, industry, and time dummies and are estimated by Tobit with White's correction for heteroskedasticity. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable corresponds to the skewness of the employment distribution. The capital mobility variable corresponds to the IMF index. Regression (1) controls for Market Capitalization/GDP, (2) for M3/GDP, (3) for Inflation, and (4) for Trade. GDP data, Domestic Credit to GDP come from WB, WDI, Bureaucratic Quality, Non-corruption, and Law and Order from ICRG. See Appendix A for a detailed description of the data.

Table B5: Robustness V—Entrepreneurship and Capital Mobility—1999 & 2004 (Weighted)  
 Dependent Variable: Entrepreneurship—Various Measures

Dependent Variable	Entry Tobit (1)	Size OLS (2)	Skewness OLS (3)	Skewness OLS (4)	Skewness OLS (5)	Skewness OLS (6)	Skewness OLS (7)	Skewness OLS (8)
IMF Index	-1.181 [0.620]**	0.561 [0.123]***	-4.613 [2.137]**	-7.362 [2.771]***	-6.924 [2.692]**	-9.294 [3.296]**	-7.124 [1.469]***	-8.394 [2.167]***
Log GDP	0.523 [0.151]***	0.050 [0.063]	4.800 [0.436]***	5.430 [0.694]***	5.358 [0.699]***	5.980 [0.745]***	5.196 [0.921]***	5.667 [0.690]***
Log GDP per capita	1/629 [0.263]***	-0.273 [0.135]**	0.267 [0.994]	-0.804 [0.966]	-0.609 [0.937]	-0.800 [1.130]	-0.900 [0.939]	-0.787 [0.945]
GDP Growth	0.169 [0.067]**	0.132 [0.043]***	-1.247 [0.263]***	-1.335 [0.369]***	-1.358 [0.319]***	-1.732 [0.393]***	-1.356 [0.331]***	-1.513 [0.326]***
Bureaucratic Quality	-1.394 [0.380]***	0.153 [0.199]	-3.926 [1.132]***	-2.948 [1.302]**	-2.930 [1.260]**	-3.402 [1.293]***	-2.532 [1.269]**	-2.993 [1.290]**
Non-Corruption	0.443 [0.193]**	-0.377 [0.130]***	2.439 [0.634]***	2.936 [0.934]***	2.719 [0.809]***	2.933 [0.969]***	3.051 [0.730]***	2.560 [0.927]***
Law and Order	0.711 [0.150]***	0.043 [0.100]	0.396 [0.509]	-0.107 [0.747]	-0.193 [0.787]	-0.374 [0.962]	0.514 [0.620]	-0.105 [0.777]
Domestic Credit/GDP	-0.004 [0.004]	-0.004 [0.002]	0.023 [0.043]*	0.109 [0.047]**	0.109 [0.047]**	0.101 [0.048]**	0.043 [0.025]*	0.105 [0.048]**
Market Capitalization/GDP	0.005 [0.004]	-0.004 [0.002]	0.045 [0.042]					
Rights Borrowers/Lenders	-0.220 [0.099]***	0.021 [0.042]	0.996 [0.278]***					
Business Disclosure Index	-0.092 [0.130]	-0.048 [0.056]	-0.004 [0.350]					
Inflation				0.109 [0.136]				
Volatility GDP					-0.105 [0.109]			
GDP Forecasts						0.102 [0.922]		
Trade							-0.004 [0.045]	
Informal Sector								0.043 [0.069]
R <sup>2</sup>		0.56	0.55	0.39	0.39	0.40	0.39	0.40
# Observations	7021	7083	5430	7076	7328	6292	6974	6868

Notes: All regressions include country, industry, and time dummies and are estimated by OLS with White's correction for heteroskedasticity and corrected at the country level (clustering), except for entry regressions, which are estimated by Tobit and are not clustered. Robust standard errors are in parentheses denoting \*\*\* 1%, \*\*5%, and \*10% significance. Regressions are weighted by the number of firms in each industry used to calculate the entrepreneurship measure. The dependent variable is age in (1); vintage in (2); skewness of employment of wholly owned firms in (3); skewness of employment in (4)-(6). Column (6) reports the two-stage least square estimates, instrumenting the international financial integration measure with LLSV variables. GDP data, Domestic Credit to GDP come from WB, WDI, Bureaucratic Quality, Non-corruption, and Law and Order from ICRG. See Appendix A for a detailed description of the data

Table C1: Spatial Analysis—  
Summary Statistics for New, Foreign, and Counterfactual Samples

Country	New firms	Foreign firms	Counterfactual Sample
Firms	87549	41921	155108
Year started	2003	1983	1982
Employees	6	61	63

Note: Data is for UK, Spain, France, and Germany. Foreign firms are those firms which report a foreign owner, and the counterfactual sample is made of foreign firms and matched domestic firms. The matching criteria is that the domestic firms be in the same 4-digit industry, its year of establishment (the first date it operated under its current ownership in that location) must be within +/- two years and its number of employees must be no more than +/- 10 percent of its counterpart.