Credit Constraints as a Barrier to the Entry and Post-Entry Growth of Firms: Lessons from Firm-Level Cross Country Panel Data.

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1 Introduction

There is growing evidence that firm dynamics - the entry and exit of firms, the continuous process of resource reallocation among incumbents, and the post entry growth of new firms - is of key importance for technological innovation and economic growth (for example see Bartelsman-Haltiwanger-Scarpetta (2004), Aghion-Howitt (2006), and Foster-Haltiwanger-Krizan (2002)). Most market economies display sizable firm dynamics with 10 to 15 percent of firms being created every year, and a similar amount being destroyed. The evidence also shows that many new firms fail in the initial years of life, and that surviving firms tend to experience significant growth, often higher than that of the incumbents (see e.g. Geroski, (1995); Bartelsman et al (2004)).

The common wisdom is that beyond technological factors, the main barriers to the entry and the post-entry growth of firms, should be: (a) adjustment costs induced by the R&D and/or advertising of incumbent firms[1]; (b) the administrative costs of creating a new firm[2]; (c) labor market regulations that may deter firms from growing too large[3]

In this paper we explore another potential factor limiting the entry and post-entry growth of firms, namely financial constraints. We first develop a stylized model in which entry costs as well as post entry growth potentials affect the entry decision, the size at entry, and the post entry expansion of firms. This model allows us to also assess whether financial development has a differential effect on entry by firms of different size, and also to analyze the impact of financial development on the post-entry growth of firms. A first prediction of

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[1]See Sutton (1999) and Geroski (1995).
[2]See Djankov et al (200X).
[3]See Scarpetta et al (2002).

the model is that relaxing credit constraints has a more positive effect on the entry of small firms than on that of larger firms. Another prediction is that higher financial development increases post-entry growth: (i) by reducing the minimum size of entering firms; (ii) by inducing such firms to invest more in capacity expansion; (iii) by selecting out, through increased market competition, those firms that have limited productivity or production capacity.

In the second part of the paper, we confront these predictions with firm-level panel data covering 9 OECD countries, three fast growing transition countries, and the four of most dynamic economies in Latin America, over the period 1990-2000. A main conclusion from this empirical exercise, is that credit constraints tend to limit entry and post-entry growth of firms to a much larger extent than labor market regulations.

To minimize possible endogeneity and omitted variable problems associated with cross-country regressions, we use a difference-in-difference approach, following Rajan and Zingales (1998). We identify an industry-level indicator that is expected to affect the way in which our financial development variable affects the decision to enter the market and, once in the market, expand. We use two complementary industry-level indicators that differentiate the effect of financial development across industries. First we use the relative growth rate of the value added in each sector of the US economy as a proxy for the potential for entry and expansion. Under the assumption that the United States are at the frontier in many sectors and are characterized by limited regulations that affect entry and post entry growth, this interacting factor should proxy for the technological and market driven potentials of the sector in the absence of policy-induced frictions. Under the additional assumption that this technological and market driven demand carries over to other countries, we assess whether industries that have the potentials for growing more rapidly in relative terms are disproportionately affected by weak financial market conditions. The second indicator refers to the relative dependence on external financing of the different sectors in the United States. Again the assumption is that industries that depend more heavily on external financing would be more affected by a weak financial market. In both cases the difference in difference approach compared with standard cross-country/cross-industry empirical studies allows exploiting within-country differences between industry/sizes based on the interaction between country and industry characteristics. Thus we can also control for country and industry effects, thereby minimizing the problems of omitted variable bias and other mispecifications.

To measure financial development we use both, an overall index of financial development and two of its main components: stock market capitalization (ratio of stock market capitalization to GDP) and private credit (ratio of the credit to the private sector to GDP).

We start our empirical analysis with a simple specification in which the entry rate weighted by employment is a function of basic controls - country, industry, size and time dummies - and the interaction between different indicators of financial development and either the relative GDP growth rate of the sector in the US or the institution-specific factor, namely the dependence of external

financing. And to test the prediction of the model about a differentiated effect of financial development on firm entry by size we allow the coefficients of financial development - and other institutional variables - to vary across size classes. In this specification we control for both country-size effects as well as for industry-size effects. Our main findings are that : (i) financial development affects the entry of small and medium size firms positively, whereas it does not significantly affect the entry of larger firms; (ii) when we include both, financial development and labor market regulations as potential determinants of entry, the former enters significantly (except for larger firms in when we interact these variables with the relative growth rate of the sector in the US).

We then proceed to regress post entry growth of successful entrants on financial development interacted with either the relative growth rate of the sector in the US or the dependence on external financing of the sector. As in the case of entry, we also consider multivariate regressions in which we also control for other factors that may affect post entry growth, in particular, labor adjustment costs. We focus on post entry growth of successful entrants after 6 years to allow for learning by doing and selection effects. Our findings are that: (i) financial development has a strong positive effect on post entry growth using either the synthetic measure of financial development or its two separate components; (ii) labor market regulations have no significant effect on post entry growth.

Our paper builds on a whole body of theoretical and empirical IO literature on entry barriers, and here we cannot hope to do full justice to this literature. So let us just provide a few references that are most directly related to our analysis. First, there is the work, already mentioned above, by Sutton (1999) and Geroski (1995) on the adjustment costs induced by the R&D and/or advertising of incumbent firms. Most closely related to our analysis, Rajan and Zingales (1998) provided empirical evidence to the effect that financial development, by reducing the costs of external finance, facilitate economic growth and the entry of new firms. We add to their contribution by using more detailed firm-level data to: (i) analyze the effect of financial constraints on entry by firm size; (ii) look at post-entry growth; (iii) compare between credit-constraints and other potential barriers to entry and post-entry growth. Djankov et al. (2002) used entry costs data computed by the World Bank (Doing Business Indicators) for a large sample of countries and showed that entry costs are significantly higher in continental Europe than in the US and generally higher in developing and most emerging economies than in industrialized countries, and they use these data in a cross-country analysis of how entry restrictions affect corruption and unofficial economy and on how economic and political factors affect entry regulations. Scarpetta et al (2002) use firm level data from OECD \10 countries to show that high product market and labor market regulations are negatively correlated with the entry of small and medium size enterprises. Bertrand and Kramarz (2002) look at the effect of the new zoning regulations in France on the expansion decisions of French retailers. Desai-Gompers-Lerner (2003) use cross-country data to show that entry regulations have a negative effect on firm entry. Klapper-Laeven-Rajan (2004) use the Amadeus database which provides firm level panel information for a large number of firms across 34 European

countries to show that entry regulations a la Djankov et al hamper entry particularly in those sectors where entry should "naturally" occur, which in turn broadly correspond to the sectors with higher growth rates in the US in our analysis. Finally, Bartelsman, Scarpetta and Schivardi (2005) explore firm-level panel data from 10 OECD countries and show: (i) that entrants are smaller in the US than in the same sectors in European OECD countries; (ii) that new firms grow faster and larger in the US than in Europe.

The paper is organized as follows. Section 2 develops our model of financial constraints and entry. Section 3 presents the data and measures. Section 4 presents the entry results. Section 5 shows the results on post-entry growth. Section 6 concludes.

2 A simple model

2.1 The setup

The following setup is directly borrowed from Aghion et al (2006). We consider an economy populated by a continuum of entrepreneurs who differ in initial size or wealth w and in potential ex post capacity which is captured by a parameter θ. Wealth w is uniformly distributed between 0 and $\bar{w}$, whereas θ is uniformly distributed between 0 and $\overline{\theta}$. There are two goods: a numeraire good which serves as production and entry input, and a consumption good, the price of which we denote by p. The timing of events is as follows:

- At date 1, entrepreneurs decide whether or not to enter the sector that produces the consumption good, and entry involves a sunk cost b in units of the numeraire good.
- At date 2, those entrepreneurs that enter the consumption good sector may decide to expand capacity. By investing I units of numeraire good, they can expand capacity from θ to $(1 + I\Delta)\theta$.
- At date 3, entrepreneurs produce and sell at the equilibrium price that clears the consumption good market. For simplicity we normalize production costs at zero. And we let $D(p)$ denote the aggregate demand for the consumption good at price p, where $D'(p) < 0$.

Credit constraints are modelled as in Aghion-Banerjee-Piketty (1999): due to ex post enforcement problems, an entrepreneur with initial wealth w cannot invest more than μw in entry and/or in capacity expansion, where μ is the credit multiplier which captures the level of financial development in the economy.

2.2 Solving the model without ex post capacity expansion

For the sake of exposition, let us first rule out the possibility of ex post capacity expansion, that is, where $\Delta = 0$. Entrepreneurs with initial wealth $w < \frac{b}{\mu}$ cannot raise enough cash to pay the entry fee, and therefore they will not enter

no matter their ex post capacity θ. Thus, the proportion of entrepreneurs who can afford the entry cost is equal to

$$\nu(\mu) = 1 - \frac{b}{\mu\bar{w}}.$$

Next, consider an entrepreneur with initial wealth $w > \frac{b}{\mu} = w^*(\mu)$. Whether she will or not enter, depends upon the comparison between her net profits

$$p\theta - b$$

if she enters, and her profit if she does not. For simplicity, we normalize the latter at zero. Then, among entrepreneurs with initial wealth $w > \frac{b}{\mu}$, only those with ex post capacity

$$\theta > \theta^* = \frac{b}{p},$$

will enter, where p is the equilibrium price on the consumption good market, determined by equating aggregate supply of that good, $S(p)$, with aggregate demand, $D(p)$.

Aggregate supply of the consumption good is equal to:

$$S(p) = \frac{\nu}{\bar{\theta}} \int_{\theta^*}^{\bar{\theta}} \theta d\theta.$$

Thus the equilibrium price p^* solves the equation:

$$D(p) = \frac{\nu}{2\bar{\theta}}(\bar{\theta}^2 - \theta^{*2}),$$

or equivalently:

$$D(p) = \frac{1 - \frac{b}{\mu\bar{w}}}{2\bar{\theta}} \left(\bar{\theta}^2 - \frac{b^2}{p^2} \right). \tag{1}$$

The equilibrium is depicted on Figure 1 below. Since the RHS of (1) is increasing in μ, we immediately get that the equilibrium price $p^* = p^*(\mu)$ is decreasing in μ. In other words, a higher level of financial development increases potential entry into the consumption good market, which in turn increases aggregate supply on that market and therefore puts downward pressure on the price.

We can now determine how an increase in the level of financial development, say from μ_0 to μ_1, affects the entry and post-entry growth of firms. First, it increases entry among small size firms: namely, firms with initial wealth $w \in (\frac{b}{\mu_1}, \frac{b}{\mu_0})$ and sufficiently high capacity will enter the market when $\mu = \mu_1$ whereas they could not do so when $\mu = \mu_0$. Second, it reduces entry among larger firms: namely, among firms with $w > \frac{b}{\mu_0}$, firms with ex post capacity $\theta \in (\frac{b}{p^*(\mu_0)}, \frac{b}{p^*(\mu_1)})$ which would enter when $\mu = \mu_0$ no longer do so when $\mu = \mu_1$. Third, a higher level of financial development increases average post

entry growth because: (i) it increases the minimum post-entry capacity from $\frac{b}{p^*(\mu_0)} = \theta_0^*$ to $\frac{b}{p^*(\mu_1)} = \theta_1^*$; (ii) it reduces the minimum pre-entry size from $\frac{b}{\mu_0} = w^*(\mu_0)$ to $\frac{b}{\mu_1} = w^*(\mu_1)$.

In words: first, higher financial development allows small firms with low initial wealth to finance the entry cost more easily. Second, because it increases competition for the consumption good, higher financial development reduces the equilibrium price of that good which in turn deters larger firms with low productivity from entering the market even though they could afford the entry cost. These two results immediately imply the third result on post-entry growth: higher financial development increases average post-entry growth both, because it reduces the minimum size of entrants, and because it raises the minimum post entry capacity of entrants due to the competition effect.

2.3 Solving the model with ex post capacity expansion

Entrepreneurs with initial wealth $w > \frac{b}{\mu}$ can now expand by investing up to $\mu w - b$ in capacity. An entrepreneur will do so whenever

$$p\Delta\theta > 1,$$

or equivalently

$$\theta > \widetilde{\theta}(p) = \frac{1}{p\Delta},$$

where p still denotes the equilibrium price on the consumption good market. Assume that $b\Delta < 1$ so that firms with ex post capacity close to $\theta^*(p) = \frac{b}{p}$ will choose not to expand capacity. The equilibrium price is then determined by:

$$D(p) = \frac{\nu}{\bar{\theta}} \int_{\theta^*(p)}^{\bar{\theta}} \theta + \int_{\widetilde{\theta}(p)}^{\bar{\theta}} \int_{b/\mu}^{\overline{w}} (\mu w - b)\Delta dw d\theta, \tag{2}$$

where $\theta^*(p)$ and $\widetilde{\theta}(p)$ are both decreasing in p.

An increase in μ will still reduce the minimum entry size from $\frac{b}{\mu_0} = w^*(\mu_0)$ to $\frac{b}{\mu_1} = w^*(\mu_1)$. Its effect on the equilibrium price $p = p^*(\mu)$, now defined by (2), is still negative. Since firms with capacity θ close to $\theta^* = \frac{b}{p}$ will choose not to expand capacity, we are back to the same result as before that a higher μ will reduce entry by larger firms. Finally, higher financial development will increase post-entry growth for the same two reasons as in the previous subsection plus the fact that it now also increases firms' ability to invest in capacity expansion.

2.4 Three main predictions

The above analysis generates the following three predictions:

1. Higher financial development increases entry by small firms;

2. Higher financial development may discourage entry by larger firms;

3. Higher financial development increases post-entry growth of firms.

In the next sections we confront these predictions with cross-sectoral, cross-country, panel data on financial development and firms' entry and post-entry growth.

3 Data

3.1 Firm-level data on entry and post-entry growth

Our analysis of entry and post-entry growth draws from a harmonized firm-level database.[4] Given data availability on entry and post-entry growth, in this paper we use data for 16 industrial, developing and emerging economies (Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, the United Kingdom and the United States, Hungary, Romania, Slovenia, Argentina, Chile, Colombia and Mexico) and covers the 1990s (the time period covered varies by country - see Table 1).

The key features of the micro-data underlying the analysis are as follows:

- Unit of observation: Data used tend to conform to the following definition: "an organizational unit producing goods or services which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources" (Eurostat (1998)). Generally, this will be above the establishment level.

- Size threshold: While some registers include even single-person businesses (firms without employees), others omit firms smaller than a certain size, usually in terms of the number of employees (businesses without employees), but sometimes in terms of other measures such as sales (as is the case in the data for France). Data used in this study exclude single-person businesses. However, because smaller firms tend to have more volatile firm dynamics, remaining differences in the threshold across different country datasets should be taken into account in the international comparison.

- Industry coverage: Special efforts have been made to organize the data along a common industry classification (ISIC Rev.3). In the panel datasets constructed to generate the tabulations, firms were allocated to the single STAN industry that most closely fit their operations over the complete time-span.

[4] The collection of the firm-level data was made possible by the active participation of country experts. It was conducted using a common protocol in order to harmonize key concepts to the extent possible (such as entry and exit of firms, job creation and destruction, and the unit of measurement), as well as the definition of common methods to compute the indicators (see Bartelsman, Haltiwanger and Scarpetta, 2004 for details).

The firm-level data come from business registers (Denmark, Finland, the Netherlands, the United Kingdom and the United States, Slovenia), social security databases (France, Germany, Italy, Mexico) or corporate tax rolls (Argentina, France, Hungary), as shown in Table 1. Annual industry surveys are generally not the best source for firm demographics, due to sampling and reporting issues, but have been used nonetheless for Chile, and Colombia. Data for Portugal are drawn from an employment-based register containing information on both establishments and firms. All these databases allow firms to be tracked over time because addition or removal of firms from the registers reflects the actual entry and exit of firms.

TABLE 1 *HERE*

We define five size classes based on the number of firm employees: 1- 19 workers, 20-49 workers, 50-99 workers, 100-249, and 250 or more workers.

3.2 Financial development and regulatory indicators

We consider two main indicators of financial development (Beck, Levine Demirgu-Kunt, 2000): i) the ratio of domestic credit to the private sector to GDP (from the IMF International Financial Statistics); and ii) the ratio of stock market capitalization to GDP (from the World Bank World Development Indicators). Moreover, we consider a synthetic indicator of *financial development* as the sum of the private credit and market capitalization ratios.

We also consider two indicators of regulations in the credit market in the sensitivity analysis. Both indicators are from "Economic Freedom of the World (EFW)" database (see Gwartney and Lawson, 2004).[5] In particular, we use:

- An indicator of the *degree of competition in the credit market*. It considers both the share of foreign bank assets in total bank assets and the rate of denial of foreign bank license. The indicator goes from 0 to 1 with increased contestability of the domestic credit market.

- An overall indicator of *credit market regulations*. It includes: a) percentage of deposits held by privately-owned banks; b) competition in banking sector; c) percentage of credit extended to the private sector; and d) interest rate controls. The indicator goes from 0 to 1 with 1 indicating lower regulatory constraints.

Entry and post entry decisions are also influenced by a host of other factors. For example, regulations affecting start-up costs are likely to affect the decision of firms to enter the market and the size of firm at entry. Likewise, employment protection legislation, by raising labor adjustment costs, is likely to affect the decision to enter the market, but also the optimal strategy of size at entry and post entry expansion once the response of the market in known. In this paper

[5] This database has been developed under the auspices of the Fraser Institute in Canada with the aid of a worldwide network of economists and research institutes.

we consider two indicators summarizing entry costs and employment protection legislation:

- Regulations affecting *start-up costs*. The indicator is from "Economic Freedom of the World (EFW)" and considers the cost and procedural inconveniences to set up a new business. The indicators referring to cost and procedures for setting up a new business have been rescaled from 0 to 1 with 1 being the most restrictive.

- Regulations on *hiring and firing of workers*. The synthetic indicator summarizes employment protection legislation (EPL) for workers with permanent and temporary contracts. For permanent contracts it includes: (i) *procedural requirements*: the process that firms have to follow from the decision to lay off a worker to the actual termination of the contract; (ii) *Notice period* required by law for the dismissal of one redundant worker in manufacturing with twenty years of tenure; and (iii) *Severance payment* for the dismissal of one redundant worker in manufacturing with twenty years of tenure. For temporary contracts the synthetic indicator includes: (1) the *objective reasons* under which they could be offered; and (2) *the maximum cumulated duration* of a contract. The detailed indicators for the different components of employment protection have then been aggregated into an overall indicator of EPL (see Pierre and Scarpetta, 2006).[6] The synthetic indicator passes simple validation tests: for example they correlate well with similar indicator constructed by the OECD for its member countries, which are arguably the most complete measures available.

  TABLE 2 HERE

3.3 Controlling for enforcement of laws and regulations

Previous research (see, e.g., Caballero et al. (2004)) suggests that the degree of enforcement of regulations varies across our sample of countries that include the OECD countries, Latin American and transition economies. Not only are some businesses and jobs not registered in Latin America and increasingly in the transition economies and some Southern European countries, but registered firms may also not fully comply with the existing rules and regulations. As an indication of the different degree of enforcement of laws and regulations, we consider the law and order indicator from the Fraser Institute (based on the Political Risk Component I (Law and Order) from the International Country Risk Guide (see, Gwartney and Lawson 2004), rescaled to vary from 0 to 1, with 1 being the best rules of law conditions). The indicator shows the highest compliance with laws and regulations in the OECD sample of countries (average of 0.56), followed with the transition economies (average of 1.76), and by the Latin American countries (average of 4.96).

[6] The aggregation process follows previous studies (e.g. OECD, 2004) and is largely based on simple averages of detailed regulatory aspects (see Pierre and Scarpetta, 2006 for more details).

To control for possibly differing degrees of enforcement of laws and regulations we adjust our regulatory variable as follows:

$$P_{c,adj} = (1 - \frac{Law\&order_c}{10})P_c.$$

4 Measurement and estimation method

4.1 The econometric strategy

We test the predictions of our stylized model by exploiting the observed industry/size and time variations in the harmonized firm-level database through a difference-in-difference approach (see Rajan and Zingales, 1998). [7] The difference-in-difference approach consists in identifying an industry-specific factor that affects the way financial development – or other business regulations – impact on the decision of firms to enter the market or expand their activities in the early years of life. We use different industry-specific factors to implement the approach.

Following Rajan and Zingales (1998), we assume that industries that depend more heavily on external financing would be more affected by a weak financial market. Thus, we use the relative dependence on external financing of each industry in the United States as the interacting factor for our country-level indicators of financial development. In the case of labor regulations, we assume that hiring and firing regulations affect entry and post entry growth especially in those industries with a high labor intensity in production, where labor costs represent a more important share of total adjustment costs.[8]

To test the robustness of our results, we also interact our institutional and policy variables with an industry-specific factor that accounts for the differential market opportunity of each industry. We use the relative growth rate of the value added in each sector of the US economy as a proxy for the potential for entry and expansion. Under the assumption that the United States are at the frontier in many sectors and are characterized by limited regulations that affect entry and post entry growth, this interacting factor should proxy for the technological and market driven potentials of the sector in the absence of policy-induced frictions. Under the additional assumption that this technological and market driven demand carries over to other countries, we assess whether industries that have the potentials for growing more rapidly in relative terms are disproportionately affected by weak financial market conditions.[9]

The advantage of the difference-in-difference approach compared to standard cross-country/cross-industry studies is that it allows exploiting within country

[7] The difference-in-difference approach has already been used in a number of empirical studies in the corporate literature (e.g., Classens and Laeven, 2003), as well as in the analysis of firm entry (Klapper et al. 2004) and in the analysis of job flows (Haltiwanger et al. (2006).

[8] Scarpetta et al. (2002) also provide some evidence of the effects of labor regulations on the entry of firms.

[9] The cross-industry correlation of average entry rate across countries and the relative growth in value added in the United States is 0.5, statistically significant at 2 percent level; while the correlation is also 0.5 with post-entry growth, statistically significant at 2 level.

differences between industry cells based on the interaction between country and industry characteristics. Thus, we can also control for country and industry effects, thereby minimizing problems of omitted variable bias and other misspecification. In addition, size specific country and sector dummies control for the differences in the size distribution that may be affected by many other variables than financial development. Size specific country dummies also control for differences in sample thresholds.

4.2 Estimated entry equations

Following our stylized model, we run a set of specifications for the entry and the post-entry equations. Our data have four dimensions: (c) country; (i) industry – 2-digit manufacturing and business services; (s) size; and (t) time. In all our specifications we control for country-size effects and industry-size effects due to other market, technological or regulatory factors not included in the regressions.

We regress entry rates on our indicators of financial development interacted with the indicator of dependence on external financing ($ExtDep$) or with the relative growth of value added in the domestic sector in the US ($Rdlva_{US}$). Alternatively, we consider labor regulations interacted with either labor intensity (L/K) or the relative growth of value added in the US ($Rdlva_{US}$).[10] Last, we interact entry cost with the relative growth of value added in the US ($Rdlva_{US}$). Thus, labeling the institutional or regulatory variable as *policy* and the industry-specific factor as *industry factor*, we can write the equations as follows:

$$\begin{aligned} Entry_{c,i,s,t} &= \beta_0 Rdlva_{c,i,t} + \delta(policy_c * industryfactor_i) + \\ &\sum_{c=1}^{C}\sum_{s=1}^{S}\beta_{c,s}D_{c,s} + \sum_{i=1}^{I}\sum_{s=1}^{S}\gamma_{c,s}D_{i,s} \\ &+ \sum_{t=1}^{T}\theta_t D_t + \varepsilon_{c,i,s,t}, \end{aligned}$$

- or

$$\begin{aligned} Entry_{c,i,s,t} &= \beta_0 Rdlva_{c,i,t} + \delta(policy_c * Rdlva_{US,i}) + \\ &\sum_{c=1}^{C}\sum_{s=1}^{S}\beta_{c,s}D_{c,s} + \sum_{i=1}^{I}\sum_{s=1}^{S}\gamma_{c,s}D_{i,s} \\ &+ \sum_{t=1}^{T}\theta_t D_t + \varepsilon_{c,i,s,t.}, \end{aligned}$$

[10] The standard deviations of the ExtDep, ($Rdlva_(US)$) and (L/K) are respectively 0.59, 2.72, 0.29.

Thus here we examine whether the difference in industry-size entry rates between industries with high or low dependence on external financing is smaller in countries with better financial markets; or whether the difference between industry-size entry rates in industries with higher or lower intensity of labor (L/K) is smaller in countries with less stringent regulations on hiring and firing, or if the difference in industry/size entry rates between industries with high or low growth potential as measured by $Rdlva_{US}$ is smaller in countries with better financial markets or labor regulations. By including the interactions between our institutional and policy variables and the industry-specific characteristic, we can control for unobserved country-size and industry-size fixed effects.

We then allow for the coefficients of the interactions of our institutional variable and the industry-specific interacting factor to vary by firm size groups. Formally, we estimate the equation:

$$\begin{aligned} Entry_{c,i,s,t} &= \beta_0 Rdlva_{c,i,t} + \sum_{s=1}^{S} \delta_s (policy_c * industryfactor_i) + \\ &\sum_{c=1}^{C}\sum_{s=1}^{S} \beta_{c,s} D_{c,s} + \sum_{i=1}^{I}\sum_{s=1}^{S} \gamma_{c,s} D_{i,s} \\ &+ \sum_{t=1}^{T} \theta_t D_t + \varepsilon_{c,i,s,t}, \end{aligned}$$

The multivariate version of this specification, in which we consider more than one institutional and regulatory variable together, can be written as follows:

$$\begin{aligned} Entry_{c,i,s,t} &= \beta_0 Rdlva_{c,i,t} + \sum_{k=1}^{K}\sum_{s=1}^{S} \delta_{k,s} (policy_{k,c} * industryfactor_{k,i}) + \\ &\sum_{c=1}^{C}\sum_{s=1}^{S} \beta_{c,s} D_{c,s} + \sum_{i=1}^{I}\sum_{s=1}^{S} \gamma_{c,s} D_{i,s} \\ &+ \sum_{t=1}^{T} \theta_t D_t + \varepsilon_{c,i,s,t}, \end{aligned}$$

where $k = 1, 2, ..., K$ is the number of regulatory variables used; and the Industry factor represents the interacting industry-specific factor (e.g. dependence on external financing, K/L ratio, or relative GDP growth).

The measure of entry rate used in the empirical analysis is the ratio of the total number of firms that entered the market in a given industry, size class and year over the total number of firms in the market. To control for size effects – within each size class – we also weight entry rate by employment. Moreover, we also allow for the coefficients of the institutional and policy variables to vary by size classes to test the predictions of the model on the differentiated effects of financial market development and other factors on small vs. larger businesses.

4.3 Post-entry growth equations

Post-entry growth data are available at different time in the life of each new cohort of entrant firms. We focus our empirical analysis on the *sixth year of life* of the new firms. This allows capturing the effects of learning by doing by new firms in the initial years of activity, as well as market selection. Our post-entry growth variables are: i) the post-entry change in employment of surviving firms after six years of activity; and ii) the total change in the employment of a cohort after 6 years. While the former only explores the post-entry performance of successful firms, the latter includes both the changes in employment of successful firms and the job losses of new firms that exit the market in the first six years of activity (we will focus on the first measure and analyze the total employment growth in the last section). Moreover, we take averages of post-entry growth and total employment changes of different cohorts over the period covered by the data. In other words, our indicators vary by country and ISIC2 industry level. Finally, we control for the growth potential of each sector by including the relative employment growth rate of incumbents in the sector. Formally, our post-entry growth equation can be written as follows:

$$\begin{aligned} PEG_{c,i} &= \beta_0 Rdlemp_{c,i} + \sum_{k=1}^{K} \delta_k (policy_{k,c} * industryfactor_{k,i}) + \\ & \sum_{c=1}^{C} \beta_c D_c + \sum_{i=1}^{I} \gamma_i D_i + \varepsilon_{c,i}, \end{aligned}$$

Moreover, since post-entry growth depends on the size at entry of the firms as well as on the average size of incumbents (there may be an optimal efficiency size depending on the market or the technology) we also include these two country-industry level variables in the analysis:

$$\begin{aligned} PEG_{c,i} &= \beta_0 Rdlemp_{c,i} + \sum_{k=1}^{K} \delta_k (policy_{k,c} * industryfactor_{k,i}) + \\ & \sigma_0 Sizeofentrants_{c,i} + \sigma_1 Sizeofincumbents_{c,i} \\ & + \sum_{c=1}^{C} \beta_c D_c + \sum_{i=1}^{I} \gamma_i D_i + \varepsilon_{c,i}, \end{aligned}$$

5 Empirical results

The results of our empirical analysis are presented in this section. In all our tables, we only show the coefficients for the policy variables and their interactions in addition to the basic control for the relative growth rate of value added in the sector (for entry regressions) or the relative growth of the size of incumbents (for post-entry growth regressions). All our tables also show robust standard errors.

5.1 Average impact on entry

Table 3 presents the first set of regressions in which we consider either the interaction between financial development and the index of dependence on external financing, or the regression with the interaction between the employment protection legislation and the labor-capital ratio.

TABLE 3 HERE

In column (1) we multiply the index on financial development with the index of external financial dependence. The coefficient is estimated using all size categories. It is positive and significant, suggesting that entry rates are, ceteris paribus, larger in industries with greater dependence on external financing in countries with more developed financial markets. Note that FD is an index of financial development that takes both private credit and stock market capitalization into account. In columns (2) and (3) we consider each component in turn The coefficient is significant and positive for both indices.[11] In column (4), we analyze the impact of employment protection legislation interacted with the labor intensity of the sector. The coefficient is positive and characterized by a large standard error.

The next step in our analysis (Table 4) is to test the robustness of the results when we use a common interacting factor for both financial development and labor regulations, the potential for growth in the sector, approximated by the relative growth rate of the sector in the US).

TABLE 4 HERE

In columns (1), we regress entry rates on the interaction between the index of financial development and the relative growth rate in the US industries. The results support the findings of the previous table, with a positive and statistically significant coefficient of the interaction. Since most of the U.S. firms are close to the technological frontier, this supports the view that credit favors entry in sectors where there is a higher potential of growth. [12]. In column (2) and (3), we break down our index on financial development into two components: private credit and stock market capitalization. We can see that only the stock market capitalization variable is statistically significant. In column (4), we present the

[11] These results are similar to Klapper, Leaven and Rajan [03], who also find a positive and significant impact of credit (interacted with the dependence in external finance) on entry. It also complements Rajan and Zingales [98], who find a positive impact of credit on growth, by using this method for the first time.

[12] These results are also consistent with those of Klapper, Leaven and Rajan [03], who find a positive and significant coefficient for the interaction between credit and entry rates in US. Klapper et al. [03] focus on the impact of institutional variables on the "natural" turnover rates, trying to control for growth potential. Thus, they show that their results also hold if the interaction factor is the exit rate instead of entry rate in US. There are a number of reasons for our choice of relative GDP growth rate rather than firm turnover rates. First, financial development is likely to affect not only the decision to enter but also the survival of young businesses. Thus, at the equilibrium, a positive impact of finance on survival may counteract the impact on potential entrants with unclear predictions on selection at entry. Moreover, sectors with higher growth potential particularly fit our simple two-period model, where previous incumbents are not taken into account. Last but not least, we can derive direct implications in term of policy to promote growth from our regressions relying on interactions with growth potential.

interaction between the employment regulation index and the relative growth rate in US. The coefficient is negative and significant. Taking into account the variance of each variable, the magnitude of the effect of employment regulations is smaller than stock market but larger than private credit [13]. In column (5), we interact the potential for growth in the sector and the index of entry cost. The coefficient is negative and significant. Again, it complements Klapper, Leaven and Rajan [2003], who interact entry cost with entry in US instead of the growth rate in US.

Finally, interactions with the growth rate in the US facilitate the comparison between institutional variables. In column (6), we include both financial development and employment protection regulation indices into the regressions. The coefficients are less significant than individually but qualitatively similar. In column (7), we compare financial development and entry cost. Both variables are statistically significant and with the correct negative sign.

How sizeable is the estimated impact of financial development on entry rates? Given our estimation approach, we consider the effect of financial development in reducing entry rates between two industries at the extremes of the dependence on external financing or the GDP growth potential. Using the coefficient on the interaction term in column (1) of Table 3, we estimate that the difference in entry rate between industry/size cells with a high dependence on external financing (90^{th} percentile of distribution in the United States) and industry/size cells with a low dependence (10^{th} percentile of the same distribution) will be 1.6 percentage points lower in a country with the lowest index of financial development compared to the United States.[14]

This average impact of financial development on entry across size categories may not look particularly strong, however as we shall see in the next subsection the effect becomes much larger once we differentiate firms by size.

5.2 Effects on entry by size categories

As stressed in the previous section, entry rates vary significantly across firm size within each country, and the predictions of our model is that regulations and financial development may impact very differently entrants with different size. In particular, according to prediction (1) and (2) (see above), we expect a positive impact of financial development on entry of small firms and a negative impact on the entry of large firms.

To test for these predictions, we relax the hypothesis of common coefficient of the interactions and allow them to vary by size classes. We first present

[13] The next section will shed light on these results: the impact of credit is actually more differentiated across size categories and may have more impact in term of composition of entrant firms than stock market capitalization or employment regulations.

[14] The estimated value is obtained as follows:

$$\beta \left[\left(ExtFin_{90^{th}} - ExtDep_{10^{th}} \right) \left(FinDev_{max} - FinDev_{min} \right) \right]$$

where β is the estimated coefficient, and $ExtDEp$ and $FinDev$ are the dependence on external financing and the indicator of financial development, respectively.

regressions on interaction with specific indices for finance and employment regulation (dependence in external finance, labor intensity) and then regressions on interaction with the potential growth rate which allows easier comparisons across institutional variables. As in the previous case, we allow for country-size and industry size fixed effects. In other words, all but one parameter (the industry-level relative growth of industry GDP) are size specific. [15].

TABLE 5 HERE

Table 5 presents the first set of interactions. In column (1), the coefficient for the interaction between financial development and external dependence is positive and significant for very small (1 to 19 employees) and small (20 to 49 employees) firms and becomes even negative for larger firms (100 to 499 employees or more than 500 employees). In other words, financial development boosts entry among small firms in sectors depending more on external finance but curbs entry among larger firms in those sectors. As we can see in columns (2) and (3), these effects are robust across different measures of financial development, namely private credit and stock market capitalization. Interacted with external financial dependence, the impact on small firms is large and positive for both and becomes negative for larger firms. The negative effect on large firms is even stronger for private credit. In column (4), we analyze the effect of employment protection legislation. The EPL indicator is interacted with the labor capital ratio. Estimated coefficients are insignificant for any size category and negative for very small firms only (note that higher values of the employment regulation index indicate stronger employment protection).

We now consider the interactions between country variables and the relative growth rate of the sector in US.

TABLE 6 HERE

In column (1), the coefficient for financial development is again positive and significant for small and very small firms and becomes negative but not significant for large firms. We thus obtain the same result on financial development, whether we consider the interaction with dependence in external finance or the relative growth rate of the sector in US. In column (2) and (3), regressions using alternatively private credit and stock market capitalization as an indices for financial development lead to the same conclusion. Here again, the negative impact on largest firms is more significant with private credit than with stock market capitalization. Concerning the interaction between the employment regulation index and the relative growth rate in US (column 4), results are slightly more significant than in table 3. The effects of labor market regulations are mostly negative, especially for small and very large firms. In column (5), we analyze the impact of entry cost. It seems that small and large firms are mostly affected by start-up costs. While the results for small firms is consistent with the idea that start-up costs represent a heavy burden for entrepreneurs with a small project scale, it is more surprising to see start up costs also affecting disproportionally larger units. In columns (6) and (7), we run multivariate re-

[15] We have also allowed the coefficient for Rdlva to be size specific, but the results do not vary significantly.

gressions where two institutional variables are included into the same regression (both interacted with the same index across industries). The effect of financial development on small firms is robust and dominates.

All in all the results presented in this section provides strong support to the predictions of our stylized model. First, financial market development has a strong positive impact on firm entry. Second, the effect is stronger for small firms and in sectors with greater dependence on external financing. For large firms, as indicated in the model, financial development may even deter entry of new firms by reinforcing incumbents. Third, these results are robust to the inclusion in the regressions of other regulatory factors that could influence the decision to entry. In particular, employment protection legislation, by raising adjustment costs of new firms, tend to reduce entry of small but also very large business. Similarly, start-up costs, as expected, tend to affect negatively entry rates, ceteris paribus.

5.3 Post-entry growth

We now check the third prediction of our model, namely that financial development should promote post-entry growth, even after controlling for the initial size at entry.

In table 7, we present the results of our regressions with interactions of the indices of financial development with the dependence in external finance, as well as the interaction between the index of employment protection legislation and the labor capital ratio.

TABLE 7 HERE

In column (1), (2) and (3), the coefficients for financial development (the overall index, private credit over GDP and stock market capitalization over GDP, respectively) are all positive and significant. In other words, financial development promotes post-entry growth in sectors with higher dependence in external finance. In column (4), we regress post-entry growth on the product of the employment protection regulation and the labor/capital ratio. We find a negative but insignificant coefficient. In columns (5) to (8), we run the same regressions controlling for both the initial size at entry and the average size of incumbents. The two variables account for the size gap between entrants and incumbents and thus the potential for expansion to reach the efficient size of operation.[16] As predicted, the coefficient for initial size is negative (large entrants grow less) and significant. The coefficient for the size of incumbents is positive and significant. Coefficients for financial development are still positive and mostly significant [17].

TABLE 8 HERE

If we interact the institutional variables with the growth potential of the sector (approximated with the relative growth rate in the US), we find very similar

[16] We allow the coefficients for size at entry and size of incumbents to be different, but also test with a size gap variable. The results are not affected by the use of this alternative variable

[17] If we only control for initial size, coefficients for financial development are also positive and significant; the coefficient for initial size is negative but slightly less significant

results. In column (1), (2) and (3), the coefficients for financial development are all positive and significant, stock market capitalization corresponding to the largest coefficient. Hence, financial development seems to foster post-entry growth in sectors with higher potential for growth compared to other sector. In column (4), the coefficient for labor market regulations is positive and insignificant. As shown in column (5), the coefficient for financial development (overall index) is robust and slightly larger if we control for labor market regulations. In columns (6) to (10), the coefficients for financial development remain positive and significant though we control for initial size and the size of incumbents.

These results provide strong support to the third prediction of our model. Financial development not only promote the entry of new firms, but also the post-entry growth of successful firms, especially in those industries that depend more of external financing or have higher than average growth potential.

6 Sensitivity analysis

This section investigates the robustness of our results along different dimensions. We use different proxies for financial development. We restrict our sample to the OECD countries. We then consider different durations for the analysis of post-entry growth and look at total employment changes of each cohort, instead of the growth of only surviving firms to account for survival and growth.

6.1 Alternative indicators of financial development

In addition to private credit and stock market capitalization, we considered two additional measures of financial market conditions from the Frazer Institute: credit regulation and competition among banks. We also control for the enforcement of law and regulations which may affect the impact of employment protection legislation and start-up regulations. The results for the entry equation are presented in table 9, and those for the post-entry growth equation are presented in table 10.

TABLE 9 *HERE*

TABLE 10 *HERE*

Concerning entry, the impact of bank competition and credit regulation is positive and significant for small firms only, which is in line with our previous results and the model. Their impact on post-entry growth is positive but less significant.

Surprisingly, results on employment protection and entry cost while taking into account the degree of enforcement through the interaction with the rule of law are not significantly improved. Thus, the impact of employment protection and entry cost on the entry by small firms and post-entry growth remains less significant in comparison with financial development.

6.2 Sensitivity to the set of countries and sectors

The empirical analysis is likely to suffer from the small number of countries or the broad definition of sectors in the sample. The main problem may be that our results are driven by few observations. Therefore it is important to check whether our results are sensible to the set of countries and sectors.

Concerning interactions with the relative growth rate in US, our regressions are significant even if we drop one country or one sector at the time, or the whole set of transition and Latin-American countries. Similarly if we focus only on manufacturing. In table 11, we respectively focus on our regressions on OECD countries (excluding Mexico and Hungary) and then to OECD manufacturing sectors. In table 12, we use the same restrictions on post-entry growth regressions.

TABLE 11 *HERE*

TABLE 12 *HERE*

We find the same patterns as with the whole set of countries. Note that relative growth rate in US may constitute a better approximation for the growth potential in OECD countries, which may also explain why our regressions using this index are still significant although we drop numerous countries. Moreover, higher significance for manufactures in OECD may also reflect a better quality of the data in those sectors.

6.3 Post-entry growth after different durations

As stressed above, we are interesting in assessing the role of financial development on post entry growth once we allow for natural learning by doing and market selection. However, it is also of importance to assess the robustness of our results to changes in the duration of life of the cohort of firms analyzed. We repeat our analysis looking at post-entry growth after 1 and two years. The effects of financial development, while correctly signed, are not statistically significant. The effects of financial development become statistically stronger as we consider longer duration. In table (13), we regress post-entry growth on financial development either interacted with the index of external financial dependence or the relative growth in US. Most of our results do hold after 4 and 5 years (being slightly less significant). Since the number of available cohorts varies in function of the duration we choose, this exercise gives an additional robustness check.

TABLE 13 *HERE*

6.4 Accounting for survival: total employment growth

Last but not least, we analyze the impact of policy variables on the total employment growth of cohorts instead of the growth of the size of surviving firms. In table 11, we reproduce the regressions from table 5 and 6 using the total employment growth of the cohort instead of the growth of the size of surviving firms. Our coefficients for financial development (interacted with dependence

in external finance or the relative growth rate in the US) are still positive and significant.

TABLE 14 *HERE*

7 Conclusion

In this paper we used a harmonized firm-level database to assess the role of financial development on firm entry, the size at entry and post entry performance of new firms. We implemented a difference-in-difference approach in which we test whether those industries with greater dependence on external financing, or greater potential for growth – as measured by the relative GDP growth of the sector in the U.S. – experience greater firm dynamism in countries with more developed financial markets. Our main empirical results are as follows: (i) financial development interacted with either of the above two sector-specific variables has a strong positive impact on firm entry; (ii) the effect is stronger for small than for large firms and that for large firms the effect may even be negative; and (iii) financial development has a positive and significant effect on the post entry growth of firms.

Entry and post-entry growth of new firms depend on a host of other factors and in our empirical analysis we also consider start-up regulations and employment protection legislation that, by raising labor adjustment costs, may discourage entry and post-entry growth. The results for financial development are robust to the inclusion in the analysis of either start-up regulations or employment protection legislation. Entry of new firms is also affected by these additional regulations, but not post-entry growth.

These findings have implications for the design of structural reform programs. In particular they suggest that the focus of policy makers should go beyond start-up regulations and labor regulations and also consider credit constraints that entrepreneurs – especially those of small firms – face when deciding to develop a new activity or to expand this activity once in the market.

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8 List of tables

Table 1. Data sources used for firm demographics

Country	Source	Period	Sectors	Availability of survival data	Threshold
Denmark	Business register	81-94	All	No	Emp ≥ 1
Finland	Business register	88-98	All	Yes	Emp ≥ 1
France	Fiscal database	89-97	All	Yes	Turnover: Man: Euro 0.58m Serv: Euro 0.17m
Germany (West)	Social security	77-99	All but civil service, self employed	Yes	Emp ≥ 1
Italy	Social security	86-94	All	Yes	Emp ≥ 1
Netherlands	Business register	87-97	All	No	None
Portugal	Employment-based register	83-98	All but public administration	Yes	Emp ≥ 1
UK	Business register	80-98	Manufacturing	Yes	Emp ≥ 1
USA	Business register	88-97	Private businesses	Yes	Emp ≥ 1
Argentina	Register, based on Integrated System of Pensions	95-02	All	Yes	Emp ≥ 1
Chile	Annual Industry Survey (ENIA)	79-99	Manufacturing	Yes	Emp. ≥ 10
Colombia	Annual Manufacturing survey (EAM)	82-98	Manufacturing	Yes	Emp. ≥ 10
Hungary	Fiscal register (APEH)	92-01	All	Yes	Emp ≥ 1
Mexico	Social security	85-01	All	Yes	Emp ≥ 1
Romania	Business register	92-01	All	Yes	Emp ≥ 1
Slovenia	Business register	92-01	All	Yes	Emp ≥ 1

Table 2

Table 2 - country variables (used for entry equations*)

Country	Financial development	Private Credit	Stock Market	Employment Protection	Cost of Entry	Rule of Law	Bank Competition	Credit Regulation
Denmark	0,73	0,43	0,30	0,14	0,37	1,00	0,88	0,91
France	1,22	0,91	0,31	0,66	0,66	1,00	0,68	0,84
Italy	0,70	0,56	0,14	0,57	0,59	0,70	0,48	0,66
Netherlands	2,36	1,57	0,79	0,30	0,25	1,00	0,82	0,90
Finland	1,04	0,76	0,28	0,53	0,15	1,00	0,89	0,89
Germany	1,29	1,00	0,29	0,56	0,50	1,00	0,78	0,78
Portugal	0,83	0,64	0,20	0,60	0,57	1,00	0,79	0,70
UK	2,26	1,11	1,15	0,09	0,19	1,00	0,93	0,93
USA	1,80	1,08	0,71	0,07	0,16	1,00	0,83	0,90
Chile	1,27	0,54	0,73	0,28	0,35	0,70	0,82	0,86
Colombia	0,37	0,26	0,11	0,48	0,74	0,00	0,77	0,76
Mexico	0,51	0,22	0,29	0,74	0,58	0,70	0,73	0,75
Slovenia	0,34	0,27	0,07	0,42	0,43	0,83	0,48	0,65
Hungary	0,46	0,22	0,23	0,19	0,26	0,67	0,69	0,80
Romania	0,10	0,08	0,01	0,79	0,64	0,67	0,81	0,50
Argentina	0,40	0,22	0,18	0,51	0,38	0,70	0,86	0,79
Mean	0,98	0,62	0,36	0,43	0,43	0,81	0,77	0,79
Standard deviation	0,68	0,42	0,31	0,23	0,19	0,26	0,13	0,12

* For post-entry growth regressions, the time coverage may differ for some countries; therefore, the average indices for financial development are slightly different)

Table 3: Entry regressions (ExtDep and L/K; average impact across size categories)

	Entry rate			
	(1)	(2)	(3)	(4)
Rdlva	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]	[0.002]
FD	0.795			
* ExtDep	[0.247]***			
Credit		1.089		
* ExtDep		[0.369]***		
Stock			1.982	
* ExtDep			[0.654]***	
EPL				2.348
* L/K				[2.059]
Observations	8717	8717	8717	8142
R-squared	0.34	0.34	0.34	0.34

OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Entry regressions (interactions with RdlvaUS; average impact across size categories)

	Entry rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rdlva	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
FD	0.134					0.110	0.066
* RdlvaUS	[0.061]**					[0.064]*	[0.065]
Credit		0.120					
* RdlvaUS		[0.093]					
Stock			0.408				
* RdlvaUS			[0.142]***				
EPL				-0.370		-0.323	
* RdlvaUS				[0.155]**		[0.164]**	
Entry cost					-0.661		-0.615
* RdlvaUS					[0.184]***		[0.193]***
Observations	7692	7692	7692	7692	7692	7692	7692
R-squared	0.33	0.33	0.33	0.33	0.33	0.33	0.33

OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Entry regressions (External dependence in finance and L/K ratio)

	Entry rate			
	(1)	(2)	(3)	(4)
Rdlva	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]	[0.002]
FD	1.875			
* ExtDep * s1	[0.363]***			
FD	1.402			
* ExtDep * s2	[0.541]***			
FD	0.367			
* ExtDep * s3	[0.544]			
FD	-0.232			
* ExtDep * s4	[0.593]			
FD	-1.643			
* ExtDep * s5	[1.006]			
Credit		3.051		
* ExtDep * s1		[0.553]***		
Credit		1.627		
* ExtDep * s2		[0.777]**		
Credit		0.549		
* ExtDep * s3		[0.789]		
Credit		-0.461		
* ExtDep * s4		[0.894]		
Credit		-2.780		
* ExtDep * s5		[1.458]*		
Stock			3.523	
* ExtDep * s1			[0.935]***	
Stock			4.292	
* ExtDep * s2			[1.603]***	
Stock			0.616	
* ExtDep * s3			[1.501]	
Stock			0.135	
* ExtDep * s4			[1.498]	
Stock			-1.843	
* ExtDep * s5			[2.409]	
EPL				-1.592
* L/K * s1				[5.109]
EPL				4.611
* L/K * s2				[4.353]
EPL				4.314
* L/K * s3				[4.100]
EPL				2.278
* L/K * s4				[4.916]
EPL				2.297
* L/K * s5				[4.326]
Observations	8717	8717	8717	8142
R-squared	0.34	0.34	0.34	0.34

Size: s1: 1-19 employees; s2: 20-49 employees; s3: 50-99 employees; s4: 100-499 employees; s5: +500 employees

OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Entry regressions (interactions with relative growth in US in the same sector)

	Entry rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rdlva	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
FD	0.264					0.228	0.203
* RdlvaUS * s1	[0.081]***					[0.086]***	[0.085]**
FD	0.413					0.409	0.384
* RdlvaUS * s2	[0.126]***					[0.124]***	[0.116]***
FD	0.045					0.018	0.070
* RdlvaUS * s3	[0.123]					[0.125]	[0.123]
FD	-0.026					-0.017	-0.107
* RdlvaUS * s4	[0.228]					[0.238]	[0.237]
FD	-0.199					-0.247	-0.358
* RdlvaUS * s5	[0.152]					[0.165]	[0.172]**
Credit		0.350					
* RdlvaUS * s1		[0.110]***					
Credit		0.485					
* RdlvaUS * s2		[0.159]***					
Credit		-0.018					
* RdlvaUS * s3		[0.180]					
Credit		-0.092					
* RdlvaUS * s4		[0.355]					
Credit		-0.394					
* RdlvaUS * s5		[0.261]					
Stock			0.654				
* RdlvaUS * s1			[0.262]**				
Stock			0.870				
* RdlvaUS * s2			[0.358]**				
Stock			0.271				
* RdlvaUS * s3			[0.262]				
Stock			0.106				
* RdlvaUS * s4			[0.447]				
Stock			-0.022				
* RdlvaUS * s5			[0.218]				
EPL				-0.621		-0.454	
* RdlvaUS * s1				[0.297]**		[0.313]	
EPL				-0.211		-0.050	
* RdlvaUS * s2				[0.296]		[0.283]	
EPL				-0.360		-0.353	
* RdlvaUS * s3				[0.298]		[0.303]	
EPL				0.119		0.113	
* RdlvaUS * s4				[0.439]		[0.460]	
EPL				-0.769		-0.837	
* RdlvaUS * s5				[0.371]**		[0.398]**	
Entry cost					-0.767		-0.563
* RdlvaUS * s1					[0.311]**		[0.328]*
Entry cost					-0.510		-0.245
* RdlvaUS * s2					[0.322]		[0.293]
Entry cost					0.181		0.223
* RdlvaUS * s3					[0.340]		[0.344]
Entry cost					-0.672		-0.737
* RdlvaUS * s4					[0.597]		[0.624]
Entry cost					-1.414		-1.601
* RdlvaUS * s5					[0.435]***		[0.477]***
Observations	7692	7692	7692	7692	7692	7692	7692
R-squared	0.33	0.33	0.33	0.33	0.33	0.33	0.34

Size: s1: 1-19 employees; s2: 20-49 employees; s3: 50-99 employees; s4: 100-499 employees; s5: +500 employees

OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7 - Post-entry growth (interactions with relative growth rate in US)

	Post-entry growth after 6 years							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rel. growth of incumbents	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]
FD * ExtDep	0.238 [0.061]***				0.233 [0.070]***			
Credit * ExtDep		0.394 [0.081]***				0.378 [0.093]***		
Stock * ExtDep			0.364 [0.167]**				0.360 [0.143]**	
EPL * L/K				-0.146 [0.381]				0.086 [0.413]
Size at entry					-0.055 [0.027]*	-0.056 [0.027]*	-0.055 [0.027]*	-0.067 [0.024]**
Size of incumbents					0.065 [0.027]**	0.066 [0.026]**	0.072 [0.025]**	0.085 [0.031]**
Observations	294	294	294	275	288	288	288	269
R-squared	0.44	0.45	0.42	0.41	0.46	0.47	0.45	0.44

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8 - Post-entry growth (interactions with relative growth rate in US)

	Post-entry growth after 6 years									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rel. growth of incumbents	0.012 [0.009]	0.013 [0.009]	0.013 [0.009]	0.013 [0.010]	0.012 [0.009]	0.012 [0.009]	0.012 [0.010]	0.013 [0.010]	0.013 [0.010]	0.012 [0.009]
FD * RdlvaUS	0.031 [0.010]**				0.034 [0.010]***	0.034 [0.013]**				0.034 [0.014]**
Credit * RdlvaUS		0.039 [0.016]**					0.034 [0.022]			
Stock * RdlvaUS			0.058 [0.024]**					0.080 [0.031]**		
EPL * RdlvaUS				0.001 [0.040]	0.025 [0.026]				-0.009 [0.047]	0.005 [0.034]
Size at entry						-0.059 [0.026]**	-0.057 [0.025]**	-0.062 [0.025]**	-0.057 [0.026]**	-0.059 [0.026]**
Size of incumbents						0.076 [0.031]**	0.077 [0.031]**	0.080 [0.028]**	0.082 [0.032]**	0.076 [0.033]**
Observations	262	262	262	262	262	256	256	256	256	256
R-squared	0.44	0.44	0.44	0.44	0.45	0.47	0.46	0.47	0.46	0.47

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9 - Entry regressions (banking competition, credit regulation, law enforcement and EPL)

	Entry rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rdlva	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Bank competition	3.905						
* ExtDep * s1	[2.281]*						
Bank competition	4.963						
* ExtDep * s2	[2.726]*						
Bank competition	-0.874						
* ExtDep * s3	[2.835]						
Bank competition	-3.418						
* ExtDep * s4	[3.075]						
Bank competition	3.424						
* ExtDep * s5	[4.494]						
Bank competition		0.791					
* RdlvaUS * s1		[0.346]**					
Bank competition		0.794					
* RdlvaUS * s2		[0.364]**					
Bank competition		-0.583					
* RdlvaUS * s3		[0.543]					
Bank competition		0.752					
* RdlvaUS * s4		[0.702]					
Bank competition		0.831					
* RdlvaUS * s5		[0.667]					
Credit regulation			4.472				
* ExtDep * s1			[2.400]*				
Credit regulation			6.384				
* ExtDep * s2			[2.666]**				
Credit regulation			-1.490				
* ExtDep * s3			[2.753]				
Credit regulation			-3.171				
* ExtDep * s4			[2.942]				
Credit regulation			-9.969				
* ExtDep * s5			[6.769]				
Credit regulation				0.806			
* RdlvaUS * s1				[0.452]*			
Credit regulation				1.372			
* RdlvaUS * s2				[0.538]**			
Credit regulation				-0.719			
* RdlvaUS * s3				[0.715]			
Credit regulation				0.238			
* RdlvaUS * s4				[0.955]			
Credit regulation				0.560			
* RdlvaUS * s5				[0.560]			
Enforcement * EPL					4.354		
* L/K * s1					[7.542]		
Enforcement * EPL					9.268		
* L/K * s2					[6.618]		
Enforcement * EPL					-1.896		
* L/K * s3					[5.351]		
Enforcement * EPL					-1.223		
* L/K * s4					[6.908]		
Enforcement * EPL					-6.053		
* L/K * s5					[6.525]		
Enforcement * EPL						-0.108	
* RdlvaUS * s1						[0.341]	
Enforcement * EPL						0.210	
* RdlvaUS * s2						[0.330]	
Enforcement * EPL						-0.334	
* RdlvaUS * s3						[0.279]	
Enforcement * EPL						0.111	
* RdlvaUS * s4						[0.490]	
Enforcement * EPL						-0.599	
* RdlvaUS * s5						[0.400]	
Enforce * Entrycost							-0.179
* RdlvaUS * s1							[0.341]
Enforce * Entrycost							0.161
* RdlvaUS * s2							[0.343]
Enforce * Entrycost							0.097
* RdlvaUS * s3							[0.311]
Enforce * Entrycost							-0.500
* RdlvaUS * s4							[0.637]
Enforce * Entrycost							-1.257
* RdlvaUS * s5							[0.471]***
Observations	7807	7692	7807	7692	7302	7692	7692
R-squared	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Size: s1: 1-19 employees; s2: 20-49 employees; s3: 50-99 employees; s4: 100-499 employees; s5: +500 employees
OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10 - Post-entry growth (banking competition, credit regulation, law enforcement and EPL)

	Post-entry growth after 6 years					
	(1)	(2)	(3)	(4)	(5)	(6)
Relative growth of incumbents size	0.012	0.013	0.012	0.013	0.012	0.013
	[0.009]	[0.010]	[0.009]	[0.010]	[0.009]	[0.009]
bank competition * ExtDep	0.251					
	[0.320]					
bank competition * RdlvaUS		0.041				
		[0.025]				
credit regulation * ExtDep			0.643			
			[0.452]			
credit regulation * RdlvaUS				0.079		
				[0.034]**		
Enforcement * EPL * L/K					-0.032	
					[0.040]	
Enforcement * EPL * RdlvaUS						0.004
						[0.004]
Observations	294	262	294	262	275	262
R-squared	0.41	0.44	0.42	0.44	0.42	0.44

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11 - Entry regressions (interactions with relative growth rate in US)

	Entry rate					
	(all sectors, OECD countries)			(manufactures, OECD countries)		
	(1)	(2)	(3)	(4)	(5)	(6)
Rdlva	-0.003	-0.003	-0.003	0.006	0.006	0.006
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
FD	0.248			0.307		
* RdlvaUS * s1	[0.096]***			[0.144]**		
FD	0.355			0.343		
* RdlvaUS * s2	[0.111]***			[0.133]***		
FD	0.032			0.236		
* RdlvaUS * s3	[0.154]			[0.143]*		
FD	-0.062			-0.012		
* RdlvaUS * s4	[0.230]			[0.227]		
FD	-0.204			-0.135		
* RdlvaUS * s5	[0.243]			[0.275]		
Credit		0.288			0.325	
* RdlvaUS * s1		[0.128]**			[0.174]*	
Credit		0.441			0.339	
* RdlvaUS * s2		[0.199]**			[0.269]	
Credit		-0.043			0.315	
* RdlvaUS * s3		[0.315]			[0.355]	
Credit		-0.083			-0.127	
* RdlvaUS * s4		[0.458]			[0.526]	
Credit		-0.492			-0.383	
* RdlvaUS * s5		[0.356]			[0.499]	
Stock			0.736			0.835
* RdlvaUS * s1			[0.287]**			[0.390]**
Stock			0.735			0.732
* RdlvaUS * s2			[0.214]***			[0.218]***
Stock			0.158			0.440
* RdlvaUS * s3			[0.222]			[0.192]**
Stock			-0.111			0.065
* RdlvaUS * s4			[0.316]			[0.308]
Stock			-0.105			-0.101
* RdlvaUS * s5			[0.472]			[0.475]
Observations	4335	4335	4335	3037	3037	3037
R-squared	0.30	0.30	0.30	0.24	0.24	0.24

Size: s1: 1-19 employees; s2: 20-49 employees; s3: 50-99 employees; s4: 100-499 employees; s5: +500 employees

OLS regressions; robust standard errors in brackets; year dummies, size specific country and industry dummies included

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 12 - Post-entry growth (interactions with relative growth rate in US)

	Post-entry growth after 6 years					
	(all sectors, OECD countries)			(manufactures, OECD countries)		
	(1)	(2)	(3)	(4)	(5)	(6)
Rel. growth of incumbents	0.006 [0.008]	0.006 [0.008]	0.006 [0.008]	0.008 [0.011]	0.008 [0.011]	0.008 [0.012]
FD * RdlvaUS	0.032 [0.009]**			0.028 [0.009]**		
Credit * RdlvaUS		0.076 [0.015]***			0.070 [0.021]**	
Stock * RdlvaUS			0.039 [0.017]*			0.036 [0.017]*
Observations	119	119	119	86	86	86
R-squared	0.59	0.59	0.59	0.58	0.58	0.58

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 13 - Post-entry growth after different durations

	Post-entry growth									
	After 6 years		After 5 years		After 4 years		After 3 years		After 2 years	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rel. growth	0.012	0.012	0.021	0.022	0.019	0.019	0.016	0.017	0.014	0.015
of incumbents	[0.009]	[0.009]	[0.006]***	[0.007]***	[0.007]**	[0.007]**	[0.006]**	[0.006]**	[0.005]***	[0.005]***
FD	0.238		0.179		0.136		0.123		0.067	
* ExtDep	[0.061]***		[0.065]**		[0.047]**		[0.024]***		[0.023]**	
FD		0.031		0.024		0.027		-0.007		-0.009
* RdlvaUS		[0.010]**		[0.019]		[0.011]**		[0.011]		[0.011]
Observations	294	262	296	264	298	267	303	270	303	270
R-squared	0.44	0.44	0.46	0.48	0.46	0.50	0.44	0.49	0.51	0.57

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 14 - Total employment growth of the cohort

	Total employment growth of the cohort after 6 years					
	(1)	(2)	(3)	(4)	(5)	(6)
Rel. growth of incumbents	0.020 [0.010]*	0.020 [0.010]*	0.019 [0.010]*	0.021 [0.010]*	0.021 [0.011]*	0.020 [0.010]*
FD * ExtDep	0.267 [0.048]***					
Credit * ExtDep		0.372 [0.101]***				
Stock * ExtDep			0.618 [0.120]***			
FD * RdlvaUS				0.025 [0.019]		
Credit * RdlvaUS					0.002 [0.033]	
Stock * RdlvaUS						0.117 [0.050]**
Observations	289	289	289	256	256	256
R-squared	0.58	0.57	0.58	0.58	0.58	0.59

OLS regressions; robust standard errors in brackets; country and industry dummies included; clusters by country

* significant at 10%; ** significant at 5%; *** significant at 1%