Business Environment and Firm Entry:
Evidence from International Data

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Abstract: Using a comprehensive database of firms in Western and Eastern Europe, we study how the business environment in a country drives the creation of new firms. Our focus is on regulations governing entry. We find entry regulations hamper entry, especially in industries that naturally should have high entry. Also, value added per employee in naturally "high entry" industries grows more slowly in countries with onerous regulations on entry. Interestingly, regulatory entry barriers have no adverse effect on entry in corrupt countries, only in less corrupt ones. Taken together, the evidence suggests bureaucratic entry regulations are neither benign nor welfare improving. However, not all regulations inhibit entry. In particular, regulations that enhance the enforcement of intellectual property rights or those that lead to a better developed financial sector do lead to greater entry in industries that do more R&D or industries that need more external finance.

Introduction

New firm entry is a critical part of the process of creative destruction that Joseph Schumpeter (1911) argued is so important for the continued dynamism of the modern economy. That it affects economic growth has been documented in previous work.[1] However, much less is known about the business environments that promote new firm creation. This is an important concern for policymakers, who in country after country are trying to implement policies that will foster entry – witness, for example, the debate in Continental Europe on the lack of home-grown venture capital in promoting new firm creation in high tech industries.[2]

A first step is to understand what the cross-country picture really looks like. We use a comprehensive, recently available database of firms across a number of developed and transition countries in Europe to address this question. Some facts are striking. For instance, one might believe that Italy, with so many small firms, should have tremendous entry. Actually, entry in Italy (the number of firms less than two years of age to the total number of firms) is only 3.8 percent compared to 13.5 percent on average for other European countries in the G-7.

What is especially little understood is the role of regulations, especially bureaucratic regulations on setting up limited liability companies, in explaining variations in patterns of entry. The early debate on such corporations emphasized the possibility that crooks might register with little capital and dupe unsuspecting investors or consumers. For instance, the Times of London thundered against the principle of free incorporation through limited liability thus in 1824:

"Nothing can be so unjust as for a few persons abounding in wealth to offer a portion of their excess for the information of a company, to play with that excess for the information of a company – to lend the importance of their whole name and credit to the society, and then should the funds prove insufficient to answer all demands, to retire into the security of their unhazarded fortune, and leave the bait to devoured by the poor deceived fish." [3]

According to this view, entry regulations serves the public interest by preventing fraud.

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[1] For example, Hause and Du Rietz (1984), Asplund and Nocke (2003), Black and Strahan (2002).

[2] "Europeans Now Seek to Revive Start-Up Spirit", Wall Street Journal, February 6, 2002.

[3] As quoted in Paul Halpern, Michael Trebilcock and Stuart Turnbull, 1980, "An Economic Analysis of Limited Liability in Corporate Law", *University of Toronto Law Review* 117: 30.

By contrast, a long literature describes regulations as devices to protect the private interests of industry incumbents (see Smith 1776, Olsen 1965, or Stigler 1971) or the regulators (Bhagwati 1979, Krueger 1974, McChesney 1997, Shleifer and Vishny 1997). For example, Smith (1776) [4]:

"To widen the market and to narrow the competition is always the interest of the dealers…The proposal of any new law or regulation of commerce which comes from this order, ought always to be listened to with great precaution, and ought never to be adopted, till after having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention. It comes from an order of men, whose interest is never exactly the same with that of the public, who generally have an interest to deceive and even oppress the public, and who accordingly have, upon many occasions, both deceived and oppressed it."

The evidence in Djankov et al. (2002) that countries with heavier regulation of entry have higher corruption and larger unofficial economies certainly is consistent with the private interest view of regulation. But it does not rule out other possibilities – for instance, regulations could be less burdensome in corrupt countries because officials can be bribed to ignore them (we do find evidence for this) so there is no strong demand to streamline them, or regulations may be promulgated in corrupt countries precisely because it is more important for an even more untrustworthy corrupt private sector to be screened.

This suggests a number of steps. First, one has to show that these regulations do affect entry. One cannot, however, ascertain this simply from a cross-country regression of actual firm entry against the size of regulations. If the coefficient estimate on regulations is negative, the skeptic could argue that causality could go the other way – that in countries with generally low entry, people are not sufficiently motivated to press for the repeal of archaic regulations that impede entry. Thus even though the regulations themselves may have no direct effect on entry, there could be a negative correlation between regulatory restrictions and entry.

To address this sort of problem, we focus on cross-industry, cross-country interaction effects (that is, we ask if entry is more likely in an industry with a particular need when the

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[4] Adam Smith 1776 ed. Edwin Canan 1976. The Wealth of Nations Chicago: University of Chicago Press, Book 1, Chapter XI, p. 278.

country scores strongly on a characteristic that facilitates meeting the need) rather than on direct industry or country effects. In particular, if we can somehow proxy for the "natural" rate of entry in an industry, we test whether entry is relatively lower in "naturally high entry" industries when they are in countries with high bureaucratic restrictions on entry.

This methodology, following Rajan and Zingales (1998), enables us to address a number of other issues as well – for instance the problem that a healthy economy scores well on a number of cross-country variables, so it is hard to estimate the direct effect of each variable in a cross-country regression (and equally hard to correct for all possible country variables that might matter). By focusing on interactions, we can absorb country level variables and instead examine the differential effects of country level variables across industries that might respond most to them. Also, some industries may be technologically more predisposed to entry. By correcting for industry effects, we also correct for the fact that average entry rates depend on the industries present in a country.

The downside of this methodology is, of course, that while it can tell us whether the country characteristics work in predicted economic ways, it cannot tell us the overall magnitude of the effect of the characteristics, only the relative magnitude.[5] But since our primary interest is to examine the validity of theories that suggest bureaucratic entry regulations should affect entry, this is not a major concern.

We find that "naturally high-entry" industries have relatively lower entry in countries that have more onerous bureaucratic entry regulations. This also suggests an explanation for the low level of entry in Italy: the average direct cost associated with fulfilling the bureaucratic regulations for setting up a new business in Italy is 20 percent of per capita GNP compared to 10 percent of per capita GNP on average for other G-7 European countries.

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[5] Of course, we could revert to cross-country regressions for that, but we cannot tell how much of the estimated effect is likely to be because of causal relationships and how much is simple correlation. See, however, Desai, Gompers, and Lerner (2003).

This does indicate that these bureaucratic regulations on entry work as intended but it does not help us distinguish between the views that these entry barriers are socially harmful and that they are socially beneficial. If these entry barriers screen appropriately as in the view that they are framed in the public interest, we should find that incumbent older firms in naturally high entry industries should grow relatively faster (than similar firms in similar industries in countries with low entry barriers) because efficient ex ante bureaucratic screening takes the place of growth-retarding wasteful competitive destruction.

By contrast, the private interest view would be more ambiguous in its predictions. By setting up protectionist entry barriers, incumbent firms might ensure themselves more growth, but the lack of competition may make them inefficient. Also, inefficient incumbent firms would have a greater incentive to leave entry barriers in place.[6] A finding that incumbent firms in naturally high-entry industries grow relatively less fast in high entry barrier countries would be consistent with the private interest view rather than the public interest view. Particularly telling would be if these industries also accounted for a relatively lower share of the economy.

The evidence is more consistent with the view that entry regulations are framed with private interests in mind rather than for the public interest. Growth in value added is relatively lower in naturally high entry industries and the share of the industry in the economy is relatively lower (though this result is weak), when the industry is in a country with higher bureaucratic barriers to entry.

Finally, it may be that countries with untrustworthy populations erect higher bureaucratic barriers so as to screen their fellowmen (though why the bureaucrats should be deemed more trustworthy is a relevant question). If this were true, bureaucratic barriers might affect entry, and might cause incumbents to become fat and lazy, but this is necessary because the alternative of unrestricted entry by charlatans would be much worse. This is a harder proposition to refute but

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[6] See Acemoglu (2003), Perotti and Volpin (2003), and Rajan and Zingales (2003) for recent interest group theories of entry regulation.

our analysis offers some evidence that is inconsistent with it. More developed countries have better developed information systems, better product inspections and quality control, better contract and law enforcement, and consequently, an entrepreneurial population less subject to misbehavior.[7] If bureaucratic rules were meant to screen entry efficiently, we should expect them to be particularly effective in low-income countries relative to high-income countries. Similarly, we should find them particularly effective in corrupt countries. It turns out that entry barriers are more effective in preventing firm creation in high income countries, suggesting their purpose is not to screen out the untrustworthy (or that low income countries have other natural barriers that prevent firm creation).

More interesting, entry barriers are effective in retarding entry only in the least corrupt countries. On the one hand, this suggests that bureaucratic entry barriers in corrupt countries may be ineffective roadblocks, meant solely for extracting bribes (see, for example, Shleifer and Vishny (1997) and Djankov et al. (2002)). However, their existence and effectiveness in less blatantly corrupt countries suggests that their purpose may well be to protect incumbents and their rents (see, for example, Acemoglu (2003), Perotti and Volpin (2003), and Rajan and Zingales (2003a)).

While our focus is on bureaucratic regulations on entry, we also examine the effects of other regulations. Interestingly, not all regulations inhibit entry. In particular, regulations that go in the direction of protecting investors – such as the accounting standards in a country – tend to improve access to credit and hence enhance entry. We find entry is relatively higher in industries that depend heavily on external finance in countries with better accounting standards. Similarly, entry is higher in R&D intensive industries in countries with better protection of intellectual

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[7] The underlying population in richer countries may also be socialized to be more honest (fewer rogues) but all that is relevant is that the richer infrastructure gives them more incentive to behave, so there is less need for screening.

property. Finally, we also examine other environmental variables, such as the presence of an educated labor force.

Taken together, our results suggest that while bureaucratic entry requirements seem to be motivated by private interests, it is by no means obvious that the best way to encourage entry and competition is to eliminate all regulation. The absence of some regulations can also be an effective entry barrier (see Rajan and Zingales (2003, a, b)). Regulations that expand access to finance and human resources seem to help entry even while those that directly screen entrants hurt entry.

In a related paper, Desai, Gompers, and Lerner (2003) use a cross-country approach and also find that entry regulations have a negative impact on firm entry. The cross-country approach has a number of limitations including variations in coverage in the database across countries, which is why we have chosen a within country, cross industry approach. Nevertheless, their findings are complementary to ours. Another paper that is closer in methodology to ours is Di Patti and Dell'Ariccia (forthcoming). They examine whether entry is higher in informationally opaque industries in Italian regions that have a more concentrated banking sector (they find it is). Their use of the Rajan and Zingales methodology is similar to ours, but the environmental variables they focus on, as well as the data they use, are very different. In another related paper, Bertrand and Kamarz (2002) examine the expansion decisions of French retailers following new zoning regulations introduced in France. They find a strong relation between increases in entry deterrence (such as rejection of expansion or entry decisions) and decreases in employment growth. A cross-country study related to ours is Scarpetta et al. (2002), who use firm-level survey data from OECD countries to analyze firm entry and exit. They find that higher product market and labor regulations are negatively correlated with the entry of small- and medium-sized firms in OECD countries. Unlike us, however, they do not focus on country and industry interaction effects.

There is also work related to other aspects of our study than entry regulation. Kumar, Rajan and Zingales (2000) find that the average size of firms in human capital intensive industries (and in R&D intensive industries) is larger in countries that protect property rights (patents). Using survey data from five transition countries on the reinvestment of profits by entrepreneurs, Johnson et. al. (2002) examine the importance of property rights. They find lower investment by entrepreneurs in countries with weak property rights. Claessens and Laeven (2003) find that growth of industries that rely on intangible assets is disproportionally lower in countries with weak intellectual property rights. Our finding that there is less entry in R&D intensive industries when intellectual property is weakly enforced echoes their findings. Finally, others have also found that financial development seems to foster entry (see Black and Strahan (2002) or Rajan and Zingales (1998)).

There is a substantial literature on entry into an industry (possibly by a firm from another industry) as distinguished from firm creation. It is the latter sense in which we use the term "entry". It would take us too much out of our way to describe the literature on industry entry, so we refer the reader to Gilbert (1989) for a comprehensive survey. Note that there are technological determinants of entry into an industry such as minimum scale, etc., which also affect firm creation. We assume these determinants carry over countries so they are absorbed by industry indicators. Our focus then is on environmental determinants of firm creation.

The paper proceeds as follows. In Section I we describe the data and in Section II we present the empirical methodology. We present the empirical results in Section III. We conclude in Section IV.

I. Data

1.1 Amadeus database

Central to our analysis is the firm-level Amadeus database. Amadeus is a commercial database provided by Bureau van Dijk. It contains financial information on over 5 million private

and publicly owned firms across 34 Western and Eastern European countries. The database includes up to 10 years of information per company, although coverage varies by country. Amadeus is especially useful because it covers a large fraction of new and small- and medium-sized companies (SMEs) across all industries. The Amadeus database is created by collecting standardized data received from 50 vendors across Europe. The local source for this data is generally the office of the Registrar of Companies.

The Amadeus database includes firm-level accounting data in standardized financial format for 22 balance sheet items, 22 income statement items and 21 financial ratios.[8] The accounts are transformed into a universal format to enhance comparison across countries. Although EU harmonization in accounting standards and practices has improved the comparability of accounting formats across countries in Europe, differences in accounting practices remain and these transformed accounts should therefore be interpreted with the necessary caution. We use IMF-IFS period average exchange rates to convert all accounting data into U.S. dollars.

In addition to financial information, Amadeus also provides other firm-level information. First, we use information on the year of incorporation to calculate the age of the firm. Second, we use firm-level employment to calculate the contribution of new and small firms to employment creation. Third, Amadeus includes the national industry code and assigns companies a 3-digit NACE code – the European standard of industry classification – which we use to classify firms and construct industry dummy variables.[9] In our analysis, we use NACE codes at a 2-digit level so that we have a sufficient number of firms per industry.

1.2 Sample selection

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[8] The coverage of these specific items varies across countries. For example, many firms in Latvia and Russia have turnover variables missing and most firms in Slovenia and Croatia only report total liabilities and do not include a breakdown of their debt structures.
[9] The NACE codes follow the NACE Revision 1 classification.

We use the 2001 edition of Amadeus and limit our sample to the years 1998 and 1999.[10] There are two reasons to limit our analysis thus. First, there is the potential problem of survivorship: As companies exit or stop reporting their financial statements, Amadeus puts a "not available/missing" for 4 years following the last included filing. Firms are not removed from the database unless there is no reporting for at least 5 years (i.e. 1997 or earlier). So the data for firms from 1997 as reported in the 2001 database will not include firms that exited in 1997 or before. To avoid this potential survivorship bias, we restrict our attention to 1998 and 1999. A second reason is that efforts were made in 1998 to expand the coverage for Central and Eastern European countries allowing us to include more countries, but making the prior data less comparable.[11]

As shown in Table 1, Column 1, we start with a sample in Amadeus of about 3 million annual observations over the years 1998-1999. We then impose a number of restrictions on the data. First, we require reporting firms to have some basic accounting information in their accounts over the years (i.e., data on total assets, sales, profit before tax, or employment). The reason for dropping those that do not report is that there may be country differences in the criteria for including firms with no information on their accounts. In addition, this criterion excludes any "phantom" firms established for tax or other purposes.

Next we delete from our sample firms that report only consolidated statements. For most firms in Amadeus, unconsolidated statements are reported and consolidated statements are provided when available.[12] We use unconsolidated financial statements to avoid double-counting firms and subsidiaries. Using unconsolidated statements has the additional advantage that we can focus on the local operations of firms and not overestimate local employment figures. For example, the consolidated statements of a European multinational include operations abroad and

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[10] Due to lags in data collection, the coverage for the year 2000 is incomplete.

[11] For example, the coverage of Central and Eastern European firms increased by 16% from 1997 to 1998, but less than 5%, on average, for the following 2 years.

[12] Although the small number of deleted firms does not creates a significant bias in entry rates based on total number of corporations, this may create some bias in the total employment figures, since consolidated firms tend to be larger. However, some employment may already be included by other group firms in the sample with unconsolidated statements.

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the employment figures refer to worldwide employment. Our use of unconsolidated statements also helps comparability because not all European countries require consolidation of accounts for all firms.

We also exclude certain industries. First, we drop several primary industries where the activity is country-specific (e.g., not all countries have uranium mines). These industries include Agriculture (NACE code 1), Forestry (NACE code 2), Fishing (NACE code 5), and Mining (NACE codes 10-14). We also exclude utilities (NACE codes 40-41) that tend to be regulated and largely state-owned industries in Europe.[13] We also drop the financial services industries (NACE codes 65 and 66) because financial ratios for financial companies are not comparable to those of non-financial companies. In addition, financial institutions tend to be subject to specific entry restrictions, (e.g. initial capital requirements) that do not apply to nonfinancial firms.[14] Finally, we drop the government/public sector, education (mainly public sector in Europe), health and social sector, activities of organizations, private households, extra-territorial organizations, and firms that cannot be classified (NACE codes 75, 80, 85, 91, 92, 95, and 99).[15] We also exclude, by country, any industries with less then three firms (although we check whether such an exclusion affects our results qualitatively). We are left with 47 NACE industries, which is the maximum number of observations per country.

Finally, we exclude all legal forms other than the equivalent of public and private limited liability corporations.[16] In particular, we exclude proprietorships and partnerships. Two arguments prompt this. First, a big and common carrot behind registration as corporations is limited liability, which allows entrepreneurs and investors to take risks. By contrast, the benefits

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[13] We also drop the recycling industry (NACE code 37), which is difficult to match with a comparable SIC code(s).

[14] See Caprio, Barth, and Levine (2004) for a discussion of financial sector regulations across countries.

[15] For robustness, we exclude additional industries that may be state-controlled, such as all mining activities.

[16] We include Plc and Ltd in the UK, AG and GmbH in Germany, and SA and SARL in France and exclude the GmbH & Co KG, which is a hybrid legal form (a combination of a partnership and a private limited company) used in Austria and Germany.

of registration as other forms may vary considerably across countries, which will make the analysis less easy to interpret.[17] Second, the coverage of proprietorships and other unincorporated firms in Amadeus is poor and uneven: in most European countries only limited liability companies are required to file statements. However, most European countries require all corporations to file financial statements, therefore, the coverage for corporations is extensive and the best available. We use the information on legal form in Amadeus – which is country-specific – to identify public and private limited companies (see Annex 4 for legal definitions, by country).

We exclude from our sample several European countries where the coverage is incomplete or the data quality is poor. In Annex 2, we summarize the cross-country differences in the collection of company accounts in Amadeus. First, we exclude Switzerland, since small firms are not required to file. Second, we exclude the countries of the former Republic of Yugoslavia (Bosnia-Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, and Federal Republic of Yugoslavia), which were at war during our sample period and where data coverage is limited. Third, we exclude Slovakia, Slovenia, Russia and the Ukraine, which have only a very small number of total filings (i.e. less than 1,000 firms annually).

As shown in Table 1, Column 2, after applying these exclusion criteria, we have a smaller, comprehensive sample of incorporated firms in a large number of European countries, which enhances comparability across countries.[18] Our sample now has over 3 million annual firms and 57 million employees.

We are not done yet. We have national statistics from Eurostat (2003) on numbers of, and employment in, firms of different sizes. In Table 2, we compare the ratio of firms and employment in Amadeus and in published national statistics in Eurostat (2003).[19] Columns 1 and 2 show the coverage in Amadeus of large firms (the ratio of firms and employment at firms with

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[17] For example, Fan and White (2003) use data on small businesses in the United States to show that personal liability negatively affects the level of entrepreneurial activity and the decision to incorporate.
[18] These restrictions exclude 342,216 firms over 2 years (9.8% of total firms).
[19] Data, by firm size, is unavailable for non-EU countries. This data will be updated to compare EU corporations when the data becomes available in 2004.

more than 250 employees in Amadeus versus that in national statistics) and Columns 3 and 4 show the coverage of small firms (the ratio of firms and employment at firms with 10-50 employees in Amadeus versus that in national statistics). Column 5 shows the absolute value of the difference between the ratio of employment in small firms to the ratio of employment in large firms in Amadeus less the ratio of employment at small and large firms in national statistics. This ratio is used to test whether our Amadeus sample is biased towards larger firms.[20]

We exclude a country from our dataset if two conditions are met: (1) if the ratio of employment in firms with more than 250 employees in Amadeus to that in national statistics (Column 2) is less than 50%, and (2) if the absolute difference between the ratios in Amadeus and national statistics of employment in firms with 10-50 employees to employment in firms with greater than 250 employees (Column 5) is more than 25%. Four countries do not meet the criteria: Iceland, Ireland, Luxembourg and Portugal. Since these cutoffs may be considered somewhat arbitrary, we also test if the qualitative results hold if we do not apply these criteria.

We believe that our inclusion criteria create the most comparable sample of firms across countries, but we should be cautious about deriving strong conclusions from direct cross-country comparisons. However, even if we have not eliminated all biases between countries, our basic test examines within-country differences across countries, and will not be affected unless there are systematic biases in reporting industries within a country. Our final sample includes 3,371,073 firms in 21 countries: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Romania, Spain, Sweden, and the United Kingdom.

1.3 Industry-level entry variables

We measure entry in a variety of different ways, both for all new firms and by size groups. We define a new firm as a firm that has age 1 or 2 and an old firm as a firm that has age

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[20] The discrepancy between Amadeus and national figures may also be explained by: (1) that for a significant number of firms in Amadeus, we do not have data on employment and (2) that for the purpose of cross-country comparisons, our Amadeus dataset excludes only proprietorships and partnerships.

greater than 2. [21]   Our analysis focuses on the contribution of new firms to the total number of firms and to employment creation, measured as (1) the percentage of new firms and (2) the percentage of employment at new firms. Our employment ratio should be used cautiously, however, since 38% of total firms do not report employment.[22] We calculate entry rates at the 2-digit NACE industry level averaged over the years 1998 and 1999.[23] We refer to this variable as Entry.[24]

We require firms to survive at least one year and exclude firms in year 0. We exclude firms less than 1 year to avoid frivolous filings and because of the difference in initial filing requirements across countries.[25] In particular, in some countries firms in their first year do not have to file accounting information until after the end of their first year of operation, while in others they have up to 1 year to file. We check that the results are not qualitatively affected by including firms of age less than 1 as new firms.

In Table 3, we describe the country averages of the entry variables that we use in our analysis. We calculate entry and new firm employment rates for (1) all firms and (2) firms with more than 10 employees. Our data for firms with greater than 10 employees are less comprehensive since employment (which we need to classify firms) is missing for about 38% of observations in our sample. As shown in Column 1, the average entry rate across industries and countries is about 13.3% (or 9.2% when excluding small firms). Since we define new firms as 2 years or younger, this is calculated over two years, on average, and corresponds to an average annual entry rate of about 6.6% (or 4.6% when excluding small firms). We find large variations in the share of new firms across countries, varying from a high entry rate of 19.2% in Lithuania to a low entry rate of 3.5% in Italy. Overall, we find an average of about 15.7% of new firms in

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[21] Our empirical results are robust to defining new firms as age equal to one.
[22] However, employment data in the UK is missing for over 85% of firms. For this reason we check that all econometric tests that use employment cut-offs are robust to the exclusion of UK data.
[23] Our empirical results are robust to using entry rates calculated for one year (1998 or 1999) only.
[24] For a complete list of variable names and definitions, see Appendix 1.
[25] However, this does not affect our results. The median share of firms with age 0 over the period 1998-99 is 2.5 percent.

Eastern European countries, as compared to 11.9% for Western European countries. This difference reflects the recent emergence of a large number of private firms in the transition economies.

Djankov et al. (2002) have data on the procedures that are officially required for an entrepreneur to obtain all necessary permits, and to notify and file with all requisite authorities, in order to legally operate a business. These data refer to 1999. These procedures include (i) obtaining all the necessary permits and licenses, and (ii) completing all the required inscriptions, verifications and notifications to enable the company to start operation. To make the procedures and companies comparable across countries, the survey assumes that the company is a limited liability company, i.e., a corporation, and the founders complete all procedures themselves (without intermediaries). This means the entry barriers are likely to be more onerous for small firms where this is likely to be true. We report in Table 3 column 5 the direct costs of setting up a new business expressed as a percentage of per capita GNP in US dollars. We find large variations in the cost of entry, varying from a high cost of 86 percent of GNP per capita in Hungary to a low cost of 1 percent of GNP per capita in Finland and the UK.

In Table 4, we present entry rates by country and a selection of industries based on groupings of 2-digit NACE codes. The highest entry rates are in communications (telephone, wireless, etc.), computer services, and services, and the lowest entry into the manufacturing of chemicals, construction, and transportation. The industries with high entry rates are generally those related to the high-tech sector, which experienced global growth over the late 1990s. Industries with lower entry rates are those that similarly faced a global decline in the late 1990s (construction) as well as traditionally more concentrated industries (such as transportation).

As a comparison, we calculate 1-year entry rates in the United States from the Dun and Bradstreet (D&B) database of over 7 million corporations. We consider D&B statistics over 1998-99 for corporations and U.S. employment only (instead of total employees internationally), for better comparison to the Amadeus data. We refer to this variable as $\text{Entry}_{US.}$ Table 4 presents

U.S. entry rates (Entry$_{US}$) for broad groupings of NACE codes.[26] Annex 3 shows U.S. entry rates for all 2-digit NACE codes. In comparing the Dun and Bradstreet data to our 1-year European entry rates, we find in the U.S. similar high entry rates in the computer and communications industries and low entry rates in industries such as mining, and water utilities. In general, we see higher entry rates in high-tech sector and lower entry rates in infrastructure related sectors.

In Table 5, we examine the size (measured by number of employees) distribution of entering firms, averaged over 1998 and 1999. The data confirm that most of the entry occurs in small firms. Interestingly, we find a greater fraction of new, larger firms in the Eastern European transition countries. This suggests that new, private firms are emerging across all size groups, rather than only small firms that require time to grow. This may also reflect a number of larger, state-owned firms that continue to be privatized and reincorporated following the transition.[27] On average, we find that about 63% of new firms have less than 10 employees, 23% have 10-50 employees, 12% have 50-250 employees and 2% have more than 250 employees. Since new firms in this largest category are likely to be existing firms that reincorporate following a merger or acquisition, we check that our qualitative results hold when we exclude new firms with more than 250 employees.

II. Methodology

We explore the differential effects of certain country characteristics on entry across industries with different natural demands for that characteristic. In other words, we are interested in the interaction between country and industry-specific variables. We use industry indicators to control for level differences across industries and country indicators to control for level differences across countries. The model is as follows:

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[26] We use the International Concordance between the U.S. 1987 SIC and the NACE Rev. 1 industrial classifications to match the 4-digit level SIC codes used by D&B with the 2-digit level NACE codes used in Amadeus.

[27] An exception to the transition countries is Romania, which includes over 200,000 firms with less than 10 employees.

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\begin{aligned}
Entry_{j,k} = Constant &+ \Phi_1 \cdot Industry\ dummies_j \\
&+ \Phi_2 \cdot Country\ dummies_k \\
&+ \phi_3 \cdot Industry\ share_{j,k} \quad\quad\quad\quad (1) \\
&+ \phi_4 \cdot (Industry\ characteristic_j \cdot Country\ characteristic_k) \\
&+ \varepsilon_{j,k}
\end{aligned}
$$

where a subscript j indicates industry j, a subscript k indicates country k, and uppercase coefficients indicate vectors. The dependent variable is the ratio of new firms to total firms of industry j in country k. We will explore several alternative definitions of what constitutes new firms. The industry indicators correct for industry-specific effects. Similarly, the country indicators correct for country-specific variables.[28] The industry j share of total sales in country k captures an industry-specific convergence effect: we correct for the possibility that sectors that are large relative to the rest of the economy experience lower entry rates.[29] Finally, $\varepsilon_{j,k}$ is an error term with the usual distributional assumptions. The focus is on the interaction term and its coefficient ϕ_4.

The critical aspect, of course, is the country characteristic and the industry characteristic. The country characteristic we focus on is the cost of fulfilling the bureaucratic requirements to register a company. Costly entry regulations will make it more difficult for new firms to enter. Djankov et al. (2002) calculate the direct costs associated with starting-up a business as a percentage of per capita GNP in 1999. Following their work, we term the log of this variable EntCost.[30]

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[28] One of the omitted variables that may explain cross-country variation in incorporation rates is differences in the tax regimes and tax treatments of corporations. In many countries, limited companies are set up for tax purposes rather than entrepreneurial activities. If this taxation difference varies across countries, this would create a hard to quantify bias. The country indicators, however, control for such differences across countries.

[29] We get similar results when we use value added rather than sales as a measure of relative industry size, but prefer to use sales as a measure of size because value added figures are missing for several industries in a number of countries.

[30] We use the log of the entry cost variable (which takes values of between zero and 1 because it is expressed in percentage terms of per capita GNP) so that in absolute terms higher costs are associated with lower values.

The industry characteristic we use stems from the methodology used by Rajan and Zingales (1998). We would expect industries that naturally have low entry barriers to be most affected by regulations on entry. We therefore need to know what entry would look like if there were few artificial or infrastructural barriers to entry – not just bureaucratic barriers but also other potential barriers like rigid labor regulation or poor access to financing. Under the assumption that these barriers are low in the United States (for instance, entry costs in the U.S. are 0.5 percent of per capita GNP relative to an average of 20 percent of per capita GNP in our sample of European countries), we would expect the rate of entry in an industry in the United States to be a good proxy for the "natural" propensity for entry in that industry – reflecting technological barriers in that industry like economies of scale or incumbent organizational efficiencies obtained from experience. Of course, there is a degree of heroism in assuming that entry in the United States does not suffer from artificial barriers (or even in assuming that there is a clear distinction between natural and artificial barriers). Nevertheless, all that is important for us is that the rank ordering of entry in the United States corresponds to the rank ordering of natural barriers across industries, and this rank ordering carries over to other countries.

As a measure of industry share, we use the Amadeus database to construct the fraction of the industry's sales in total sales of firms in the country. We refer to this variable as Industry Share. We use the average of this variable for the years 1998-1999. We calculate this country-industry level variable for 2-digit NACE industries using data in Amadeus. These industry shares in total sales are expected to capture a potential convergence effect.

In the basic regression then, EntCost is our country characteristic and Entry$_{US}$ is the industry characteristic indicating whether the industry has "naturally high entry". If as hypothesized, bureaucratic entry requirements do have effect, they should particularly impede entry in industries that are naturally prone to entry (or seen another way, entry into an industry

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that is a natural monopoly should be little affected by the existence of bureaucratic entry barriers). So we expect coefficient ϕ_4 to be negative.

III. Results

3.1 The Basic Regression and Permutations

In Table 6A, column (i) we present the basic regression, estimated using a Tobit regression with censoring at 0 and 1. The coefficient of the interaction term is negative and significant at the 1 percent level. Since we take the log of entry cost, which takes values between zero and one, lower entry costs result in a more negative value for our entry cost variable. Together with the negative coefficient on the interaction term, this means that we find that relative entry into industries with high entry in the U.S. is disproportionally higher in countries with low entry costs.

Since this is a difference in difference estimate, it is worth pointing out what the coefficient means. Take an industry like retail trade (NACE code 52) that is at the 75th percentile of $Entry_{US}$ and an industry like manufacturing of pulp, paper, and paper products (NACE code 21) that is at the 25th percentile of $Entry_{US}$. The coefficient estimate suggests that the difference in entry rates between retail and pulp in the Czech Republic (that is at the 25th percentile in terms of EntCost with entry costs equal to 8 percent of per capita GNP) is 0.5 percentage points higher than the difference in entry rates between the same industries in Italy (that is at the 75th percentile in terms of EntCost with entry costs equal to 20 percent of per capita GNP). In other words, moving from Italy to the Czech Republic benefits the high entry retail sector relatively more. As a comparison, the mean difference in entry rates between the retail and pulp industries across countries is 5.0 percent. This suggests that the effect of regulatory entry barriers accounts for about 10 percent of the mean difference.

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In column (ii) we use as an alternative entry regulation variable the logarithm of the number of procedures required to set up a business from Djankov et al. (2002).[31] Our results are robust. We find higher entry rates into industries with high entry in the U.S. in countries with fewer entry procedures. The coefficient estimate suggests that the difference in entry rates between retail and pulp in Sweden (that is at the 25th percentile in terms of the number of entry procedures) is 0.8 percentage points higher than the difference in entry rates between the same industries in Spain (that is at the 75th percentile in terms of the number of entry procedures). In column (iii) we include the monetized value of the entrepreneur's time to set up a business in the cost of entry. We obtain this variable from Djankov et al. (2002). The results are robust to using this alternative measure of the cost of entry regulation.

Next, we estimate using different samples. In column (iv), we exclude transition countries. Privatization has resulted in the emergence of a large number of private firms in these economies, and we want to make sure our results are not driven by this. Our results are robust to the exclusion of these countries. Our results are also robust to adding back those countries that failed to meet our inclusion criteria (i.e., Iceland, Ireland, Luxembourg and Portugal), and to dropping one country at a time (not reported).

In column (v) we present estimates restricting the sample to firms with over 10 employees. Since many firms that include information on age and sector are missing employment (and financial data), we exclude industries where more than 50% of firms have missing employment data (about 13% of observations). With the caution that employment coverage is limited, we find that the coefficient for the interaction term is negative and statistically significant

Next, we try different methods of estimating. In column (vi), we estimate an OLS regression rather than Tobit. In column (vii) we estimate our regression using weighted least squares (WLS) with the logarithm of the number of corporations, by industry and country, as our

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[31] The maximum value of number of entry procedures in the sample is 16, for Italy and Romania.

weights. We expect our entry rates to be more precisely estimated for industries with a larger number of firms. In both estimations the size of the interaction coefficient remains significant.

Finally, we consider different measures of entry. In column (viii) the dependent variable is the fraction of employment in new firms rather than the ratio of the number of new firms to the total. This is calculated as the number of employees at new firms divided by total employment. We exclude industries where more than 50% of firms have missing employment data and large new firms (with more than 250 employees), which are likely to be mergers or spin-offs of existing firms. We find a negative, but insignificant, coefficient estimate on the interaction term.[32] Since entry barriers are more likely to bind for small firms, we should expect a weakening of the basic result here.

3.2. Robustness to outliers

Our estimation strategy can be thought of as a difference-in-difference estimation, where we divide the countries into two groups: High entry regulation (HR) and low entry regulation (LR), and the industries into two groups: High entry (HE) and Low entry (LE). If we abstract away from any control variables, our estimate is: [HE(HR) – LE(HR)] – [HE(LR) – LE(LR)]. This estimate captures the average effect only. For robustness, we employ a similar non-parametric difference-in-difference estimation strategy to investigate whether the effect is generally present in all countries and industries.[33]

We first divide the countries into HR and LR, and then rank the industries from the lowest natural entry to the highest. Next, we pick the lowest natural entry industry (LWE) as our reference industry, and repeat the difference-in-difference estimation above for each remaining industry J, i.e., we compute: [J(HR) – LWE(HR)] – [(J(LR) – LWE(LR)], for each industry J. In Figure 1 we plot the result against the ordered industries.

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[32] We also find an insignificant and negative coefficient if we include firms with more than 250 employees.
[33] We thank Atif Mian for this suggestion.

The effect is strongest for the computer and related activities (NACE 72) and post and telecommunications (NACE 64) industries. We also find that, on average, the effect is larger (i.e., DD is more negative) for industries with higher natural entry (as indicated by the plotted regression line in Figure 1), but the effect is not linear across countries (not all observations are on the regression line).

Next, we repeat the exercise for countries, i.e., we divide industries into low entry (LE) and high entry (HE), and order countries from Lowest to Highest entry regulation. In figure 2, we plot the result against the ordered countries. Again, we find that the average effect is consistent with our main results, although the effect is not present in all countries. The effect is strongest for Norway and the United Kingdom. What is reassuring is that no industry or country appear to be driving the results.

3.3. Alternative Measures

In Table 6B we examine alternatives to U.S. entry rates as measures of the natural propensity to enter. In columns (i-ii) we use other measures of mobility. We calculate $Exit_{US}$, which is the share of firms that exit in the U.S. Dun and Bradstreet data. It is calculated as the number of firms that exited in year t (because of closure or acquisition) as a percentage of all firms in year t-1. This measure is averaged for the industry over the period 1998-99. Prior literature (Dunne et al. 1988) finds that exit rates and entry rates are strongly correlated – the more there is creation through young firms, the more destruction there also is. So $Exit_{US}$ should serve as a proxy for "natural entry" and when we replace $Entry_{US}$ with it in the regression, the interaction has the appropriate negative sign and is significant.

In column (ii) we also use the Dunn and Bradstreet data to calculate SME, the ratio of Small and Medium Enterprises (SMEs), which we define as businesses with less than 250 employees. Since new firms are generally also small, we expect greater entry into industries with larger shares of smaller firms. Indeed, we find a significantly negative coefficient, suggesting that higher entry costs discourage entry to industries with larger shares of SMEs.

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In columns (iii-iv) we use measures of market size, by 2-digit NACE industry and country. We use the Compustat data of U.S. listed firms to calculate SCALE as the log of median total assets and SIZE as the log of median total sales. Total assets and sales take values less than 1 (they are divided by 10 billion US dollars) so that the log is a negative number, and more negative values denote smaller sized industries. Since entry costs are more negative when low, the positive coefficient indicates smaller scale/size industries have relatively more entry in low entry cost countries.

Columns (v-vi) use Compustat data on U.S. firms to calculate measures of concentration. In column (v) we calculate the share of total sales in the largest 4 firms (as measured by total sales) by 2-digit NACE code and country, and in column (vi) we calculate the Herfindahl-Hirschman measure of industry concentration. We test the null hypothesis that since entry should be higher in less concentrated industries, a positive coefficient suggests that if entry costs are high, entry should be lower in industries with less concentration. For both measures of concentration, we find positive but statistically insignificant coefficients. One explanation is that industries dominated by a few large firms may have substantial entry. For example, although the car manufacturing sector is dominated by a few international firms, there are many small and new firms that provide intermediate goods.

3.4 The Consequences of Preventing Free Entry

Thus far, we have focused on how bureaucratic entry regulations differentially affect entry. This does indicate that these bureaucratic rules work as intended but it does not help us distinguish between the views that these entry barriers are socially harmful and that they are socially beneficial. If these entry barriers screen appropriately as in the view that they are framed in the public interest, we should find that incumbent older firms in naturally high entry industries should grow relatively faster (than similar industries in countries with low entry barriers) because efficient ex ante bureaucratic screening takes the place of growth-retarding wasteful competitive

destruction. These industries should account for a relatively larger share of the economy. An opposite finding would be more consistent with the private interest view.

In Table 7, we examine the effect of entry regulation on the relative performance and share of incumbent or established firms, defined as all firms with age more than 2 (i.e., we exclude new firms though we get similar results if we include them). We use the growth in value added per employee as a measure of firm performance and the industry's share in value added as our measure of industry size. To reduce the influence of outliers, the dependent variable in the regressions in this table are censored.

In columns (i-iv), we show Tobit estimations where the dependent variable is the Real Growth in Value Added per employee over the period 1998-99 averaged over all incumbent firms in the industry in a country. Value added is computed as Earnings before interest, taxes, depreciation and amortization, plus labor costs. In column (i), the negative significant coefficient estimate on the interaction variable indicates that incumbent firms in naturally high entry industries have relatively less growth in value added when they are in a country with high entry regulations.

Again, it is worth pointing out what the coefficient means by comparing the retail trade industry that is at the 75th percentile of Entry$_{US}$ and the pulp and paper manufacturing industry that is at the 25th percentile of Entry$_{US}$. The coefficient estimate suggests that the difference in real growth rates between retail and pulp in the Czech Republic (that is at the 25th percentile in terms of EntCost) is 0.7 percentage points higher than the difference in real growth rates between the same industries in Italy (that is at the 75th percentile in terms of EntCost). In other words, moving from Italy to the Czech Republic benefits the growth rate of the high entry retail sector relatively more. Since the average real growth rate is 1.0 percent, this is a sizeable magnitude.

We also include other measures of firm entry. Column (ii) shows that our results are robust to the substitution of entry rates with the percentage of SMEs, defined as firms with less than 250 employees. Columns (iii-iv) show a significant effect of the interaction of market size

and entry costs. Columns (v-viii) show that our results are robust to including legal origins in La Porta, et al. (1998) as an instrument for entry regulation.

Finally, in column (ix), the dependent variable is the share of incumbent firms in the industry in overall value added for the country in 1999. We find a negative coefficient estimate, but the effect is not statistically significant. One possible explanation is that entry barriers persist in countries where high-entry industries are large and thus have the political power to lobby for the barriers. When this is set against the fact that the barriers retard growth in these industries, we may find an insignificant coefficient of the interaction on average industry share.

Taken together, these results suggest that entry regulations seem to adversely affect the growth (and to a lesser extent the size) of those industries that might be presumed to most benefit by the added selectivity that such regulation might bring. This strongly suggests that such regulations are not intended in the public interest.

3.5 Selection Issues

The last findings, however, suggest potential selection problems. One way to test the direction of causality is to use instruments. It has been generally found that the origin of a country's legal system seems to be strongly associated with the regulatory system in place today (see, for example, La Porta et al. (1999)). While there has been some debate about the precise mechanism by which this association exists, a country's legal origin offers a proxy for predetermined components of regulation. When we instrument entry regulation with legal origin, we find that the coefficient estimate for the interaction term is highly significant, the same sign and approximately the same magnitude as shown earlier in Tables 6 and 6A (see Table 8 column (i-v)).[34]

A second concern is that countries with more untrustworthy populations may erect higher bureaucratic barriers so as to screen would be entrepreneurs more carefully. If this were true,

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[34] The legal origin variables explain 59 percent of the variation in the entry cost variable. Entry costs tend to be lowest in countries with Anglo-Saxon and Scandinavian legal origin and highest in countries with French legal origin.

bureaucratic barriers might affect entry, and might cause incumbents to become fat and lazy, but this is necessary because the alternative of unrestricted entry by charlatans would be much worse.

This question is partly addressed by the instrumental variable regression above. Another way to address it is to check if indeed the underlying population results in differential selection. More developed countries have better developed information systems, better product inspections and quality control, better contract and law enforcement, and consequently, an entrepreneurial population less subject to misbehavior.[35] If bureaucratic rules were meant to screen entry efficiently, we should expect them to be particularly effective in low-income countries relative to high-income countries. In Table 8 column (vii) we estimate different slopes for the interaction variable for whether the industry is in an above-sample-median per capita income country or below sample-median per capita income country. If, in fact, entry regulations screened more effectively in low income countries where there is less alternative infrastructure to assure compliance, we should find the coefficient estimate for the interaction in below-sample-median income countries to be significantly more negative. It is not.[36]

Similarly we find that entry barriers work most effectively in preventing entry in low corruption countries rather than in high corruption countries (Table 8, column (viii)), suggesting their purpose cannot be to select amongst an untrustworthy population. This finding is interesting in its own right for it suggests that while the purpose of entry barriers in corrupt countries may well be to extract bribes and not so much to prevent entry, their purpose in less corrupt countries may indeed be to protect incumbents.

Taken together, these results suggest that the regulation of entry cannot be attributed to benign neglect or to the prevailing untrustworthiness of the private sector in a country – it seems purposeful and probably intended to protect inefficient incumbent firms.

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[35] The underlying population in richer countries may also be socialized to be more honest (less adverse selection) but all we need is that the richer infrastructure gives them more incentive to behave, so there is less need for screening.

[36] When allowing for different slopes for transition versus non-transition countries, we find a stronger effect for non-transition countries, i.e., for countries where we expect a stronger legal system etc. (not shown).

3.6 Other Regulations and the Business Environment

We have focused on the regulation of entry. There are, however, other regulations and aspects of the business environment that might affect entry. Let us consider some in this sub section.

3.6.1. Labor regulation

First consider labor market regulation, specifically laws that prevent a firm from firing employees. This could cut both ways. One could argue that strict labor regulations protect employees and give them the confidence to join small, untested firms (much in the way that good corporate governance offers investors confidence), thus reducing start up costs. There may be other forces at work in the same direction. Regulations may hamper the growth of large incumbent firms, whose adherence to regulations is more easily monitored, thus creating the space for new firms to enter. However, one could argue for the opposite effect of labor regulations on entry: the cost of compliance with regulations may have fixed components, which make them particularly costly for small businesses to meet, and could inhibit entry. Small firms may not be able to afford to keep their employees through downturns, and thus might under hire in the face of strict labor regulations.

We use a measure of firing costs obtained from Nicoletta et al. (2000) that captures the costs of individual dismissals of employees with regular contracts. The measure is calculated using factor analysis of original data collected by the OECD (1999) and ranges from 0 to 6, with a higher score indicating a higher cost. The data refer to 1998. We refer to this index as the cost of dismissals, or LabCost. Unfortunately we do not have this measure for all firms in our sample, so we also use a more general index from Botero et al. (2003), which indicates the strictness of labor regulations in the country in 1997. This index, the Employment laws index, was constructed by examining the detailed provisions in the labor laws regarding alternative employment contracts, conditions of employment, and job security. The index takes values between 0 and 3,

with higher values implying that regulation is more protective of a worker. We refer to this index as EmpLaw.

Following our methodology, we need to find an industry characteristic that would make an industry most susceptible to labor regulation. We would expect labor regulations to impinge the most on industries that are most labor intensive. We calculate Labor Intensity, LabInt, from US data. It is the industry median over all Compustat firms in that industry of the number of employees divided by the amount of fixed assets (in millions of dollars), and is calculated over all firm-years in the 1998-99.[37] A higher score indicates higher labor intensity.[38]

We report summary statistics and correlations for industry and country level variables in Table 9 and regression estimates in Table 10. In Table 10, column (i) the country variable is the OECD measure of the cost of dismissal. The interaction coefficient is negative and significant. In column (ii), it is the more widely available but more general index from Botero et al. (2003). The coefficient estimate remains negative and significant. Note that the Botero et al. index is a more general measure of labor protection that in addition to the ability to dismiss workers (job security) includes other aspects of labor protection, such as alternative employment contracts and conditions of employment. We conclude that there is strong evidence that labor protection hampers entry in labor intensive industries.

3.6.2 Regulations Protecting Property

Lest the reader believe that we are on our way to advocating some sort of anarchical environment as being best for entry, consider regulations protecting property rights and protecting investors (another form of property protection). First, consider intellectual property.

Strong patent protection could dissuade entry because it protects incumbents and forces new entrants to carve a wide path around existing intellectual property. On the other hand, new entrants do not have the organizational structure, finance, or intellectual capital to create a

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[37] The number of employees (in thousands) is measured using Compustat item 29.
[38] We have explored the use of other measures of labor intensity such as employees over total assets and get similar results.

significant first mover advantage and thus dissuade potential imitators. As a result, they might have a greater incentive to do research if they know their research will be protected legally.

Following the now familiar method, our country level variable is Intellectual Property Rights, IntProp, which is a measure of the protection of intellectual property in a country. This variable is estimated by the World Economic Forum (2002) and was used previously by Claessens and Laeven (2003).

The industry variable measured from U.S. data, R&D, is a measure of dependence on research and development and equals the industry-level median of the ratio of research and development expenses to sales for Compustat firms in the same industry over the period 1990-99.[39] The numerator and denominator are summed over all years for each firm before dividing.

In Table 10 column (iii), we report regression estimates. The interaction variable is positive and significant suggesting there is more entry in R&D intensive industries in countries that protect intellectual property better. We find similar results when using a more general index of property rights from the Economic Freedom Index constructed by the Heritage Foundation (not shown).

3.6.3 Access to Finance

Let us turn next to access to finance. Evans and Jovanovic (1989) show theoretically that wealth constraints affect entrepreneurship, e.g., liquidity constraints hinder people from starting businesses. This suggests that entry rates should be lower in countries with less developed financial systems.[40] In fact, Rajan and Zingales (2003a) suggest the absence of regulations protecting investors could be a very effective barrier to new firm creation.

As our country measure, we use FinDev, which proxies for the depth of financial markets, and indirectly captures the regulations that promote financial development. We use the sum of two measures: First, as a measure of banking development we include the ratio of

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[39] We measure R&D using Compustat item 46, and sales using Compustat item 12.
[40] Rajan and Zingales (1998) find that there are more new establishments in industrial sectors with greater external financing needs in more developed financial systems.

domestic credit to the private sector to GDP from the International Monetary Fund's International Financial Statistics (IMF-IFS). Second, as a proxy for capital market development we use the ratio of stock market capitalization to GDP from the World Bank Development Indicators (WDI). Since the stock of credit and market capitalization only indirectly captures the effect of investor protection, as an alternative direct measure we use the Accounting Standards, AccStan, in a country. This is available for only a subset of countries in our data set and measures the number of items disclosed by the largest corporations in a country (see La Porta et al. (1998) for details).

For the industry variable, External Financial Dependence, ExtFin, is a measure of dependence on external finance and equals the industry-level median of the ratio of capital expenditures minus cash flow over capital expenditures. The numerator and denominator are summed over all years for each firm before dividing. This variable measures the portion of capital expenditures not financed by internally generated cash. Cash flow is defined as the sum of funds from operations, decreases in inventories, decreases in receivables, and increases in payables. Capital expenditures include net acquisitions of fixed assets.[41]

In Table 10 columns (iv) and (v) we find as predicted that entry is higher in more financially intensive industries in countries that have higher financial development. We find similar results when using private credit to GDP or stock market development individually as measure of financial development (not shown).[42]

3.6.4 Human Capital

Next, while we have just examined the effects of access to capital, one might also consider access to specialized human capital. In industries that need skilled human capital, there

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[41] Cash flow is calculated using Compustat item 110, if available, and otherwise by the sum of Compustat items 123, 125, 126, 106, 213, and 217, plus the change in working capital (the sum of Compustat items 302, 303, and 304). Capital expenditure is calculated as the sum of Compustat items 128 (capital expenditure) and 129 (net acquisitions).

[42] For robustness, we replace FinDev with Trade Credit, the average ratio of accounts payable to total assets. We find that industries with higher dependence on trade credit financing exhibit higher entry rates in countries with relatively weak financial institutions. This finding is similar to Fisman and Love (2003) who use a similar methodology, but a different dataset for a larger number of countries, and find that industries with higher dependence on trade credit financing exhibit higher growth rates in countries with relatively weak financial institutions.

may be two ways of creating it. The first could be to train unskilled personnel in house. The second is to give them better general education so that they can be trained up quickly. Incumbent firms may have an advantage if much of the training has to be done in-house, while new entrants are better off if there is a wide pool of well-educated labor that can be brought up to speed quickly without prolonged on-the-job training. This implies that entry should be higher in industries that require high skills in countries with a better-educated work force.

As our country variable, we use Edu, which measures the average schooling years in the total population of age 25 and above, and captures the regulations that promote education. We use data for the year 1995 from Barro and Lee (2000), which is an update of the data and methodology developed in Barro and Lee (1996).

As our industry variable, we include a measure of hourly US wage rates as a proxy for the required skill level in the industry. Wage is obtained from the Occupational Employment Statistics (OES) Survey, Bureau of Labor Statistics, U.S. Department of Labor. This survey covers over 130 million employees in the U.S., and therefore includes employees at both small and large firms. The wage rates are collected at the 3-digit SIC level and we convert them at the 2-digit NACE code level. In Table 10 column (vi), we find that entry is indeed higher in high wage industries in countries that have a better educated work force, although the effect is not statistically significant.

Finally, we have presented interactions one at a time thus far. Some of the interaction variables are strongly correlated (see Table 9) so it is hard to estimate their effect independently. Nevertheless, in Table 10 column (vii), we present a regression with all the interactions included (when we have used two proxies for an effect, we include the one that has the most data for this regression). We find that all variables retain their predicted effect and statistical significance except the financial sector interaction.

3.6.5 Eurostat

Finally, we analyze "official" data from Eurostat, which is calculated by the European Union (EU) using confidential census data for a sample of 9 EU countries, by "EU-industries", which are broader than 2-digit NACE codes. We do not have data from this sample for non-EU, transition countries or for certain industries. For example, whereas we calculate using the Amadeus database about 600 observations by country and 2-digit NACE industry codes, Eurostat only includes about 250 observations. Eurostat provides entry rates, calculated as the one-year change in the number of firms, and exit rates, calculated as the number of firms exiting the industry, excluding mergers and acquisitions.

Table 11, Panel A shows that our entry rates across countries and industries using the Amadeus database and Eurostat data are significantly correlated at about 67%. In addition, both Amadeus and Eurostat entry rates are highly correlated with Eurostat exit rates. This is consistent with Dunne, Roberts, and Samuelson (1988), who find a strong positive relationship between entry and exit rates across U.S. industries. Panel B shows correlations by 2-digit industry code, averaged across countries. We find that Eurostat entry rates are strongly significantly correlated at the industry-level with Amadeus entry rates and D&B U.S. entry rates at 90% and 60%, respectively. This suggests that (i) our calculations using the Amadeus data are in line with official figures and (ii) industry-level entry rates are broadly similar in both Europe and the U.S. Table 12 shows that our main regression results are robust to the substitution of entry rates from Eurostat.

IV. Conclusion

This paper uses cross-country data to identify the impact of regulations on entry with a view to determining what motives might prompt such regulation. We also examine other potential environmental factors that could affect entry. We use the Amadeus database, which includes financial data on over 3 million firms in Western and Eastern Europe. This data improves upon previously used datasets in that it includes (1) a large number of private, unlisted and publicly traded corporations and (2) all sectors (it is not limited to manufacturing). This database offers a

unique opportunity for us to construct entry rates across sectors and test the effect of diverse industry- and country-level characteristics on new firm creation.

To summarize our results, we find that entry regulations hamper entry, especially in industries that naturally should have high entry. The value added by naturally "high-entry" industries grows more slowly in countries with high entry barriers. Entry regulations have these adverse effects primarily in countries that are less corrupt. Taken together, all this suggests entry regulations are neither benign nor welfare improving. We do not imply all regulations inhibit entry. In particular, regulations that enhance the enforcement of intellectual property rights or those that lead to a better developed financial sector do lead to greater entry in industries that do more R&D or industries that need more external finance.

The plausible point is that one cannot make a blanket assertion that government intervention has a unidirectional effect on entry and growth. Regulations that protect intellectual property, promote schooling, and develop financial markets tend to have favorable effects while excessive bureaucratic regulation of entry tends to have adverse effects. Identifying the optimal degree of government intervention in regulating the environment in which firms operate, however, is a matter for further research.

References

Acemoglu, Daron, 2003, The form of property rights: Oligarchic vs. democratic societies, Mimeo, Department of Economics, Massachusetts Institute of Technology.

Asplund, Marcus, and Volker Nocke, 2003, Firm turnover in imperfectly competitive markets, Penn Institute for Economic Research working paper 03-010.

Bain, Joe S., 1956, *Barriers to new competition*. Cambridge, Mass: Harvard University Press.

Barro, Robert J., and Jong-Wha Lee, 1996, International measures of schooling years and schooling quality, *American Economic Review*, Papers and Proceedings 86, 218-223.

Barro, Robert J., and Jong-Wha Lee, 2000, International data on educational attainment: Updates and implications, CID Working Paper no. 42, Harvard University.

Barth, James R., Gerard Caprio, Jr., and Ross Levine, 2004, Bank supervision and regulation: What works best?, *Journal of Financial Intermediation*, Forthcoming.

Bertrand, Marianne, and Francis Kramarz, 2002, Does entry regulation hinder job creation? Evidence from the French retail industry, *Quarterly Journal of Economics* 117, 1369-1413.

Bhagwati, Jagdish N., 1979, Revenue-seeking and rent-seeking: the theory of commercial policy, Mimeo, Massachusetts Institute of Technology, Cambridge, MA, May 1979.

Black, Sandra E. and Philip E. Strahan, 2002, Entrepreneurship and bank credit availability, *Journal of Finance*, 57, 2807-2833.

Blanchard, Olivier, and Franceso Giavazzi, 2001, Macroeconomic effects of regulation and deregulation in goods and labor markets, National Bureau of Economic Research Working Paper No. 8120.

Botero, Juan, Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2003, The regulation of labor, mimeo, Harvard University, March 2003.

Claessens, Stijn, and Luc Laeven, 2003, Financial development, property rights, and growth, *Journal of Finance* 58(6), 2401-2436.

De Soto, Hernando, *The other path* (New York: NY, Harper and Row, 1990).

Desai, Mihir, Paul Gompers, Josh Lerner, 2003, Institutions, capital constraints and entrepreneurial firm dynamics: Evidence from Europe, NBER Working Paper No. w10165, December 2003.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2002, The Regulation of entry, *Quarterly Journal of Economics* 117, 1-35.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2003, Courts, *Quarterly Journal of Economics* 118, 453-517.

Dunne, Timothy, Mark J. Roberts, and Larry Samuelson, 1988, Patterns of firm entry and exit in U.S. manufacturing industries, *RAND Journal of Economics* 19, 495-515.

European Commission (1998), Enterprises in Europe, Fifth Report, Eurostat, Luxembourg: Office for Official Publications of the European Communities.

European Commission (2001), Enterprises in Europe, Sixth Report, Eurostat, Luxembourg: Office for Official Publications of the European Communities.

Evans, David S., 1987, Tests of alternative theories of firm growth, *Journal of Political Economy* 95, 657-674.

Evans, David S., and Boyan Jovanovic, 1989, An estimated model of entrepreneurial choice under liquidity constraints, *Journal of Political Economy* 97, 808-827.

Evans, David S., and Linda S. Leighton, 1989, Some empirical aspects of entrepreneurship, *American Economic Review* 79, 519-535.

Evans, John and John Fingleton, 2002, Entry regulation and influence of an incumbent as special interest group, CESifo working paper no. 787.

Fan, Wei, and Michelle J. White, 2003, Personal bankruptcy and the level of entrepreneurial activity, *Journal of Law & Economics* 46(2), 543-568.

Fisman, Raymond and Inessa Love, 2003, Trade Credit, Financial Intermediary Development and Industry Growth, *Journal of Finance* 58, 353-374.

Geroski, Paul A., 1995, What do we know about entry, *International Journal of Industrial Organization* 13, 421-440.

Gilbert, Richard J., 1989, Mobility Barriers and the Value of Incumbency, In: Richard L. Schmalensee and Robert D. Willig (Eds.), *Handbook of Industrial Organization* Volume 1, Chapter 8, Elsevier, North-Holland.

Gibrat, Robert, 1931, *Les inégalités économiques; applications : aux inégalités des richesses, à la concentration des entreprises, aux populations des villes, aux statistiques des familles, etc., d'une loi nouvelle, la loi de l'effet proportionnel*. Paris : Libraire du Recueil Sirey.

Hause, John C., and Gunnar du Rietz, 1984, Entry, industry growth, and the microdynamics of industry supply, *Journal of Political Economy* 92, 733-757.

Johnson, Simon, John McMillan and Christopher Woodruff, 2002, Property rights and finance, *American Economic Review* 92, 1335-1356.

Jovanovic, Boyan, 1982, Selection and the evolution of industry, *Econometrica* 50, 649-670.

Krueger, Anne O., 1974, The political economy of the rent-seeking society, *American Economic Review* 64, No. 3., 291-303.

Kumar, Krishna, Raghu Rajan, and Luigi Zingales, 2002, What Determines Firm Size?, mimeo, University of Chicago.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1998, Law and Finance, *Journal of Political Economy* 106, 1113-1155.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1999, The quality of government, *Journal of Law, Economics, and Organization* 15, 222-279.

Lel, Ugur, and Gregory Udell, 2002, Financial constraints, start-up firms and personal commitments, University of Indiana working paper.

Lucas, Robert E., Jr., 1978, On the size distribution of business firms, *Bell Journal of Economics* 9, 508-523.

Mansfield, Edwin, 1962, Entry, Gibrat's law, innovation, and the growth of firms, *American Economic Review* 52, 1023-1051.

McMillan, John, and Christopher Woodruff, 2002, The central role of entrepreneurs in transition economics, *Journal of Economic Perspectives* 16, 153-170.

Perotti, Enrico and Paolo Volpin, 2003, The political economy of entry: Lobbying, inequality and financial development, mimeo, University of Amsterdam.

Petersen, Mitchell, and Raghuram Rajan, 1994, The benefits of firm-creditor relationships: Evidence from small business data, *Journal of Finance* 49, 3-37.

Petersen, Mitchell, and Raghuram Rajan, 2002, Does distance still matter? The information revolution in small business lending, *Journal of Finance* 57, 2533-2570.

Pigou, Arthur G., *The economics of welfare*, 4th edition (London: MacMillan and Co. 1938).

Rajan, Raghuram, and Luigi Zingales, 1998, Financial Dependence and Growth, *American Economic Review* 88, 559-586.

Rajan, Raghuram and Luigi Zingales, 2003a, The great reversal: The politics of financial development in the 20th century, *Journal of Financial Economics* 69(1), 5-50.

Rajan, Raghuram and Luigi Zingales, 2003b, *Saving capitalism from the capitalists*, Crown Publishing, Random House, New York.

Scarpetta, Stefano, Phillip Hemmings, Thierry Tressel and Jaejoon Woo, 2002, The role of policy and institutions for productivity and firm dynamics: evidence from micro and industry data, Working paper No. 329, Economics department, OECD.

Simon, Herbert A., and Charles P. Bonini, 1958, The size distribution of business firms, *American Economic Review* 48, 607-617.

Stigler, George G., 1971, The theory of economic regulation, *Bell Journal of Economics and Management Science* II, 3-21.

Sutton, John, 1997, Gibrat's legacy, *Journal of Economic Literature* 35, 40-59.

Appendix 1: Definition of Variables

Variable	Description
Amadeus industry-level variables	
Entry	Share of new firms in the total number of firms. We define new firms as firms with age 1-2. Average for the years 1998-99. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Entry > 10 employees only	Share of new firms in the total number of firms. We define new firms as firms with age 1. Average for the years 1998-99. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Employment Creation	Share of employment of new firms in the employment of all firms. We define new firms as firms with age 1-2. Average for the years 1998-99. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Industry Share	Fraction of the industry's sales in total sales. Average for the years 1999-99. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Growth in value added per employee	Growth in value added per employee over the period 1998-99 averaged over all incumbent firms in the industry in a country. Incumbent firms are defined as firms with age greater than 2. Value added is computed as Earnings before interest, taxes, depreciation and amortization, plus labor costs. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Share in value added	Share of incumbent firms in the industry in overall value added for the country in 1999. Incumbent firms are defined as firms with age greater than 2. We calculate this country-industry level variable for 2-digit NACE industries. Source: Amadeus.
Eurostat industry-level variables	
Eurostat Entry	Entry rate for the year 1999 by Eurostat industry (based on 2-digit NACE industries). Source: Eurostat.
Eurostat Exit	Exit rate for the year 1999 by Eurostat industry (based on 2-digit NACE industries). Source: Eurostat.
U.S. Benchmark variables	
Total Assets (Scale)	Industry-level median of total assets. We compute this measure for all U.S. firms for the year 1995. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
Total Revenues (Size)	Industry-level median of total revenues. We compute this measure for all U.S. firms for the year 1995. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
4-firm concentration ratio (Conc)	Industry-level 4-firm concentration ratio, based on firm-level total revenues. We compute this measure for all U.S. firms for the year 1995. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
Herfindahl-Hirschman index (HH)	Industry-level Herfindahl-Hirschman index, based on firm-level total revenues. We compute this measure for all U.S. firms for the year 1995. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
External financial dependence (ExtFin)	Measure of dependence on external finance, equal to the industry-level median of the ratio of capital expenditures minus cash flow over capital expenditures. The numerator and denominator are summed over all years for each firm before dividing. Cash flow is defined as the sum of funds from operations, decreases in inventories, decreases in receivables, and

	increases in payables. Capital expenditures include net acquisitions of fixed assets. This definition follows Rajan and Zingales (1998). We compute this measure for all U.S. firms for the period 1990-99. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
R & D intensity (R&D)	Measure of dependence on research and development, equal to the industry-level median of the ratio of research and development expenses to sales. The numerator and denominator are summed over all years for each firm before dividing. We compute this measure for all U.S. firms for the period 1990-99. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
Labor intensity (LabInt)	Measure of labor intensity, equal to the amount of employees per value added, industry medians of ratios over all firm-years in the relevant time period. We compute this measure for all U.S. firms for the period 1990-99. A higher score indicates higher labor intensity. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Source: Compustat.
Hourly wage rate (Wage)	Hourly wage rate, industry medians. We compute this measure for all U.S. firms for the period 1999. Calculated for 2-digit NACE industries (original data on a 3-digit SIC level). Source: Occupational Employment Statistics Survey, Bureau of Labor Statistics, U.S. Department of Labor. Survey covers most firms and employees in the U.S.
Entry U.S. (Entry$_{US}$)	Entry rates for U.S. corporations. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Average for the years 1998-99. Source: Dun & Bradstreet.
Exit U.S. (Exit)	Exit rates for U.S. corporations. Calculated for 2-digit NACE industries (original data on a 4-digit SIC level). Average for the years 1998-99. Source: Dun & Bradstreet.
Country-Level Variables	
Entry cost (EntCost)	Cost of business registration, expressed as a percentage of per capita GNP. Data for the year 1999. Source: Djankov et al. (2002).
Entry cost and time (EntTime)	Cost of business registration, including the monetized value of the entrepreneurs time. Source: Djankov et al. (2002).
Entry procedures (EntProc)	Number of procedures to register a business. Data for the year 1999. Source: Djankov et al. (2002).
Intellectual property rights (IntProp)	Index of intellectual property rights for the year 2001. Source: World Economic Forum.
Cost of dismissals (LabCost)	Sub-index of labor regulations capturing the costs of individual dismissals from Nicoletta et al. (2000) based on factor analysis of data in OECD (1999). Ranges from 0 to 6. A higher score indicates higher costs. Data refer to 1998.
Employment laws (EmpLaw)	Index of labor regulations from Botero et al. (2003). Ranges from 0 to 3. A higher score indicates that regulation is more protective of a worker. Data refer to 1997.
Private credit to GDP (Priv)	Ratio of domestic credit to the private sector scaled by GDP. Source: International Monetary Fund's International Financial Statistics (IMF-IFS).
Stock market capitalization (MCap)	Ratio of stock market capitalization to GDP. Source: World Bank World Development Indicators (WDI).
Financial Development (FinDev)	The sum of the private credit and market capitalization ratios. Source: IMF-IFS and WDI.
Accounting standards (AccStan)	Measure of accounting standards. Score from 0 (low) to high (100). Source: LLSV (1998). Original source: International Accounting and Auditing Trends, Center for International Financial Analysis & Research, Inc.
Human capital (Edu)	Measure of education attainment defined as the average years of schooling of population age over 25. Source: Barro and Lee (1996, 2000).

Table 1: Number of firms, corporations and employment, by country and year

This table summarizes (i) the total number of firms, (ii) the total number of corporations (plc and ltd, or similar) and (iii) employment included in the Amadeus database. We exclude about 25,000 firms with no financial data (i.e., inactive firms). The total employment figures exclude firms with missing employment in all years. We use current employment figures to replace lagged employment figures if previous year(s) employment are missing and to extrapolate forward employment figures if current year(s) employment is missing.

	(i)		(ii)		(iii)	
	Total Firms		Total Corporations		Total Employment	
Country	1998	1999	1998	1999	1998	1999
Austria	25,243	27,170	18,224	19,684	737,114	717,498
Belgium	229,171	244,361	215,709	230,352	1,459,269	1,501,236
Bulgaria	28,272	38,840	17,004	21,167	1,113,907	1,116,755
Czech Republic	7,153	7,613	7,153	7,613	1,424,975	1,472,515
Denmark	72,989	82,639	68,906	77,720	902,078	961,128
Estonia	10,438	27,407	10,243	26,737	269,042	321,308
Finland	47,646	57,781	46,286	55,765	789,208	867,984
France	652,376	676,781	584,274	604,155	7,640,624	7,724,623
Germany	468,865	519,759	334,305	372,167	10,266,932	10,005,253
Greece	17,617	18,604	17,297	18,280	708,412	710,973
Hungary	29,397	17,404	25,731	15,794	854,131	751,858
Ireland	15,184	10,587	13,835	9,759	104,543	78,324
Italy	117,670	126,514	111,736	120,393	4,598,602	4,808,664
Latvia	2,433	2,681	2,244	2,482	226,195	232,865
Lithuania	1,123	1,247	1,113	1,228	180,049	144,779
Netherlands	145,634	153,430	145,454	153,276	587,366	581,869
Norway	104,836	115,804	104,836	115,804	991,191	1,059,226
Poland	10,605	10,309	8,668	8,451	2,667,816	2,423,589
Portugal	21,351	23,798	20,734	23,096	396,088	195,393
Romania	302,705	318,020	287,657	303,374	4,027,310	3,506,044
Spain	166,688	180,621	164,879	178,662	4,849,609	4,894,020
Sweden	193,333	204,936	193,333	204,936	1,931,973	2,022,113
UK	506,610	863,498	491,891	833,033	10,712,104	10,545,236
Total	3,218,450	3,770,760	2,896,065	3,408,713	58,289,265	57,511,010

Table 2: Comparison with National Statistics

This table compares the number of corporations in Amadeus in 1999 with the total number of firms according to 1996 data from Enterprises in Europe: 6th report (Eurostat, 2003). The Amadeus ratios are calculated using our extrapolated employment data and the number of corporations (PLCs and LTDs). The national data includes all enterprises, including proprietorships. Enterprises with 0 employees are excluded from both samples. Enterprises in Europe only includes EU-countries, which excludes Eastern European countries, Norway, and Switzerland. Columns (i-ii) indicate the coverage in Amadeus of large firms. Column (i) is equal to the ratio of total firms with more than 250 employees in Amadeus to total firms with more than 250 employees in national statistics. Column (ii) is equal to the ratio of total employment of firms with more than 250 employees in Amadeus to total employment at firms with more than 250 employees in national statistics. Columns (iii-iv) indicate the coverage in Amadeus of small firms. Column (i) is equal to the ratio of total firms with more than 10-50 employees in Amadeus to total firms with 10-50 employees in national statistics. Column (ii) is equal to the ratio of total employment of firms with 10-50 employees in Amadeus to total employment at firms with more than 10-50 employees in national statistics. Column (v) indicates whether there is a bias in the relative coverage of large (versus small) firms in Amadeus. Column (v) is equal to the absolute value of the difference between the ratio of employment in firms with 10-50 employees to employment in firms with more than 250 employees in Amadeus and the ratio of employment in firms with 10-50 employees to employment in firms with more than 250 employees in national statistics. All data is shown as percentages. Because of reported data availability, statistics for large firms in Iceland is measured as firms with more than 100 (rather than 250) employees.

	(i)	(ii)	(iii)	(iv)	(v)
	Coverage of large firms by number of:		Coverage of Small Firms by number of:		Relative coverage of small firms
Country	Firms	Employees	Firms	Employees	
Austria	44.4%	38.7%	54.6%	65.2%	10.6%
Belgium	70.0%	57.4%	65.9%	50.6%	15.3%
Denmark	100.0%	77.2%	63.3%	73.1%	9.8%
Finland	125.0%	90.2%	39.0%	42.4%	3.4%
France	65.2%	54.2%	66.8%	57.8%	9.0%
Germany	34.3%	39.0%	47.4%	49.5%	2.1%
Greece	200.0%	84.4%	58.0%	97.7%	39.7%
Iceland	30.0%	39.3%	6.2%	37.9%	31.7%
Ireland	33.3%	14.8%	23.1%	67.9%	44.8%
Italy	57.9%	78.5%	45.3%	100.0%	54.7%
Luxembourg	40.0%	38.3%	2.9%	82.2%	79.3%
Netherlands	14.3%	11.9%	31.5%	46.4%	14.9%
Portugal	33.3%	20.5%	12.8%	117.5%	104.7%
Spain	83.3%	98.6%	53.2%	99.0%	45.8%
Sweden	114.3%	105.6%	43.7%	47.8%	4.1%
UK	85.1%	79.4%	8.6%	31.0%	22.4%

Table 3: Entry rates, by country, average 1998-99

This table shows entry rates of new firms in Amadeus, averaged by country across industries for the period 1998-99. Columns (i-ii) include all firms and Columns (iii-iv) exclude firms with less than 10 employees. We report both the percentage of new firms and employment at new firms. Note that the sample sizes differ because some firms are missing employment data, i.e. Columns (i-ii) include all firms that include age, even if employment is missing. We exclude the agricultural, mining, utility, finance, and public sectors. We exclude country-industry observations based on less than 3 firm observations. New firms are defined as corporations of age 1 and 2. Columns (v-vi) shows the number of entry procedures and entry costs as a percentage of per capita GNP, respectively (Djankov, et al. 2002). All data are shown as percentages.

Country	(i) % of new firms	(ii) % of employment at new firms	(iii) % of new firms	(iv) % of employment at new firms	(v) Number of entry procedures	(vi) Entry cost (% of per capita GNP)
	All firms:		Firms with more than 10 employees:			
Austria	13.00	11.78	12.20	12.55	9	27.28
Belgium	11.58	4.08	5.37	3.40	8	9.98
Bulgaria	8.60	2.05	5.34	2.49	10	14.41
Czech Republic	11.55	7.15	10.05	7.71	10	8.22
Denmark	13.66	5.36	8.26	4.60	3	10.00
Estonia	20.41	11.95	14.17	11.00	n.a.	n.a.
Finland	11.13	6.78	6.15	6.41	5	1.16
France	14.68	5.55	7.20	4.39	15	14.30
Germany	12.34	7.88	7.78	7.65	10	15.69
Greece	15.44	8.17	11.45	8.06	15	58.60
Hungary	17.38	5.41	13.20	5.57	8	85.87
Italy	3.46	2.59	2.10	2.61	16	20.02
Latvia	18.16	10.53	16.20	10.57	7	42.34
Lithuania	19.23	9.16	18.30	10.18	10	5.46
Netherlands	8.48	5.90	6.04	7.29	8	18.41
Norway	16.87	14.13	12.39	13.90	4	4.72
Poland	12.04	6.28	10.69	6.22	11	25.46
Romania	17.97	13.51	11.76	13.25	16	15.31
Spain	11.41	6.03	7.49	5.56	11	17.30
Sweden	7.90	3.49	5.32	3.05	6	2.56
UK	15.01	5.17	6.28	5.05	5	1.43
Averages:						
Western Europe	11.92	6.69	7.54	6.50	8.85	15.50
Transition countries	15.67	8.26	12.46	8.37	10.29	28.15
All countries	13.35	7.28	9.42	7.21	9.35	19.93

Table 4: Entry rates across Europe and the U.S., by 2-digit NACE code

This table shows entry rates of new firms across Europe and the U.S. by 2-digit NACE code groups. In columns (ii-vi), European data are from Amadeus, averaged across countries, and averaged for the years 1998-99. Columns (ii-v) define new firms as corporations of age 1 and 2 and column (vi) defines new firms as corporations age 1, to compare to the U.S. data. In column (vii), data on U.S. entry rates are from Dunn & Bradstreet, averaged for the years 1998-99, and new firms are defined as corporations of age 1. Data are shown as percentages. We exclude the agricultural, mining, utility, finance, and public sectors (NACE codes 5-7, 10-14, 50-51, 65-67, 85, and 91-92). We also exclude country-industry observations based on less than 3 firm observations. "Total" is the average of all non-excluded 2-digit NACE codes.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
		Europe					U.S.
		Age 1 and 2				Age 1	
		All Firms:		Firms with more than 10 employees:		All Firms:	
Industry	2-Digit NACE Industry Code	New Firms	New Empl.	New Firms	New Empl.	New Firms	New Firms
Manufacturing	15 – 36	11.07	6.24	8.26	6.37	6.00	6.31
- Manufacture of chemicals	24	9.53	3.60	6.34	3.49	4.64	6.08
- Manufacture of office machinery and computers	30	15.53	8.49	11.06	8.24	9.33	8.67
- Manufacture of radio, television, and communication equipment	32	14.35	8.65	11.41	8.37	7.14	8.45
Construction	45	13.56	7.18	7.88	6.30	6.51	8.14
Trade	50 – 52	14.27	8.24	8.69	7.43	6.92	5.86
Hotels and Restaurants	55	14.73	8.15	10.93	7.40	7.42	5.95
Transportation	60 – 63	13.90	6.21	9.19	6.26	7.58	6.74
Communications	64	26.71	15.34	21.11	16.03	14.00	10.09
Services	70 – 74, 93	18.01	10.15	11.18	9.36	9.77	7.51
- Computer services	72	22.19	10.99	13.23	9.80	12.49	10.73
Total	15 – 93	13.27	7.33	9.22	7.19	7.09	6.65

**Table 5: Size Distribution of New firms in Europe,
by country and firm size, average of 1998 and 1999**

This table shows the average shares of new firms in Amadeus, by firm size and country, averaged over the period 1998-99. New firms are defined as corporations with age 1 or 2. Data are shown as percentages of total new corporations.

	(i)	(ii)	(iii)	(iv)
	Percentage of new corporations with employment:			
Country	< 10	10-50	50-250	> 250
Austria	61.32	29.89	7.04	1.76
Belgium	91.18	7.44	1.17	0.20
Bulgaria	54.51	24.10	16.64	4.75
Czech Republic	28.18	34.83	29.39	7.60
Denmark	82.57	15.42	1.74	0.27
Estonia	77.39	19.36	2.72	0.53
Finland	87.37	9.70	2.30	0.63
France	90.91	8.00	0.93	0.16
Germany	80.50	16.05	2.71	0.74
Greece	54.54	40.42	4.49	0.54
Hungary	43.03	38.90	14.83	3.24
Ireland	7.89	34.54	52.30	0.00
Italy	66.18	23.21	8.35	2.25
Latvia	50.02	31.37	14.80	3.81
Lithuania	36.38	47.04	12.79	3.78
Netherlands	57.67	23.15	16.33	2.85
Norway	86.42	11.68	1.55	0.36
Poland	19.50	28.42	41.87	10.20
Portugal	50.87	28.35	16.50	4.28
Romania	92.07	6.02	1.44	0.46
Spain	68.06	27.54	3.82	0.58
Sweden	91.32	7.54	0.98	0.17
United Kingdom	70.14	17.18	9.83	2.85
Averages:				
Western Europe	69.80	20.01	8.67	1.18
Transition countries	50.14	28.76	16.81	4.30
All countries	62.96	23.05	11.50	2.26

Table 6A: Determinants of Entry Rates

This table shows Tobit regressions with censoring at 0 and 1, an OLS regression, and a weighted least squares regression. The dependent variable in columns (i-vii) is the ratio of new firms (defined as age 1- 2) to total firms, averaged over the period 1998-99, by 2-digit NACE industry code and country (Amadeus). Industry Share is the industry share in sales (Amadeus). $Entry_{US}$ is the ratio of new firms to total firms in the U.S., by 2-digit NACE industry code (Dunn & Bradstreet). Columns (i) shows a Tobit regression that interacts $Entry_{US}$ with country-level entry costs (Djankov, et al, 2002). Column (ii-iii) shows a Tobit regression that interacts $Entry_{US}$ with the number of entry procedures and the monetized value of the entrepreneur's time in the entry cost variable, respectively (Djankov, et al, 2002). Column (iv) shows a Tobit regression that excludes transition countries. Column (v) includes shows a Tobit regression that only firms with more than 10 employees, excluding industries with less than 50% of firm coverage for employment. Column (vi) shows OLS regression results and Column (vii) reports weighted least squares (WLS) estimates with weights based on the logarithm of the number of firms in that industry with nonmissing age data. The dependent variable in column (viii) is the ratio of employment at new firms (defined as age 1- 2), averaged over the period 1998-99, by 2-digit NACE industry code and country. This ratio is calculated excluding large new firms (defined as employment greater than 250). We also exclude industries with less than 50% of firm coverage for employment. All regressions include a constant, country dummies and 2-digit industry dummies, not shown. Standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively. See Appendix 1 for complete variable definitions and sources.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
	Fraction of new firms							Fraction of employment at new firms
	Tobit Regressions					OLS	Weighted least squares	Tobit
	Entry Costs	Entry procedures	EntCost & Time	Excl. Transition	>10 employees only			
Industry Share	-0.092 (0.108)	-0.093 (0.109)	-0.095 (0.108)	0.157 (0.123)	-0.224* (0.122)	-0.092 (0.091)	-0.041 (0.076)	-0.131 (0.101)
$Entry_{US}$ * EntCost	-0.175*** (0.047)			-0.110*** (0.041)	-0.237** (0.110)	-0.175*** (0.066)	-0.201*** (0.063)	-0.089 (0.089)
$Entry_{US}$ * EntProc		-0.656*** (0.177)						
$Entry_{US}$ * EntCost&Time			-0.211*** (0.055)					
Observations	708	708	708	484	591	708	708	602
R-squared	-	-	-	-	-	0.59	0.65	-

Table 6B: Determinants of Entry Rates: Alternative Proxies for Natural Propensity to Enter

This table shows Tobit regressions with censoring at 0 and 1. The dependent variable in all columns is the ratio of new firms (defined as age 1- 2) to total firms, averaged over the period 1998-99, by 2-digit NACE industry code and country (Amadeus). Industry Share is the industry share in sales (Amadeus). EntCost is country-level entry costs (Djankov, et al, 2002). Columns (i-ii) interacts EntCost with the percentage of U.S. firms that exited and the percentage of U.S. firms defined as SMEs (with less than 250 employees), respectively, averaged over the period 1998-99, by 2-digit NACE industry code (Dunn & Bradstreet). Columns (iii-iv) examines market size and interact EntCost with medium assets and sales, respectively, of U.S. firms, averaged over the period 1998-99, by 2-digit NACE industry code (Compustat). Columns (v-vi) examine market concentration and interact EntCost with the concentration ratio of sales at the largest 4 firms (measured by total sales) and by the Herfindahl-Hirschman index, averaged over the period 1998-99, by 2-digit NACE industry code (Compustat). All regressions include a constant, country dummies and 2-digit industry dummies, not shown. Standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively. See Appendix 1 for complete variable definitions and sources.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Exit	SME	Scale	Size	Conc4	HH
Industry Share	-0.081	-0.083	-0.087	-0.088	-0.085	-0.085
	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)
Exit * EntCost	-0.032**					
	(0.015)					
SME * EntCost		-0.007*				
		(0.004)				
Scale * EntCost			0.002***			
			(0.001)			
Size * EntCost				0.002***		
				(0.001)		
Conc * EntCost					0.004	
					(0.003)	
HH * EntCost						0.002
						(0.001)
Observations	708	708	708	708	708	708

Table 7: Determinants of industry performance and size

This table shows Tobit regressions with censoring at 0 and 1. The dependent variable in columns (i) to (viii) is the industry-level growth in value added per employee at firms with age >2 (i.e. excluding new firms). Columns (i-iv) estimate a Tobit regression, columns (v-viii) show IV estimations, and column (ix) shows a Tobit estimation. We use the legal origin variable in LSSV (1998) as instrument for entry regulation. The dependent variable in column (ix) is the industry-level share in value added. All dependent variables are calculated using data for the year 1999, by 2-digit NACE industry code and country, and excluding observations based on less than 3 firms. Growth observations are left-censored at -50% and right-censored at >100%. Share in value added observations are left-censored at 0% and right-censored at 100%. Industry Share is the industry share in sales (Amadeus). EntCost is country-level entry costs (Djankov, et al, 2002). Columns (i-ii) and (v-vi) interact EntCost with the percentage of U.S. firms that entered and the percentage of U.S. firms defined as SMEs (with less than 250 employees), respectively, averaged over the period 1998-99, by 2-digit NACE industry code (Dunn & Bradstreet). Columns (iii-iv) and (vii-viii) interact EntCost with medium assets and sales, respectively, of U.S. firms, averaged over the period 1998-99, by 2-digit NACE industry code (Compustat). All regressions include a constant, country dummies and 2-digit industry dummies, not shown. Standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively. See Appendix 1 for complete variable definitions and sources.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
	Growth in value added per employee								Share in value added
	Tobit Estimation:				IV Estimation:				
Industry Share	-0.050	-0.030	-0.048	-0.040	-0.178	-0.165	-0.173	-0.166	
	(0.530)	(0.529)	(0.530)	(0.530)	(0.378)	(0.378)	(0.376)	(0.378)	
Entry * EntCost	-0.426**				-0.211*				-0.006
	(0.202)				(0.113)				(0.018)
SME * EntCost		-0.039**				-0.026***			
		(0.015)				(0.001)			
Scale * EntCost			0.006**				0.006***		
			(0.003)				(0.001)		
Size * EntCost				0.007**				0.006***	
				(0.003)				(0.001)	
Observations	572	572	572	572	558	558	558	558	596
R-squared	-	-	-	-	0.18	0.18	0.18	0.18	-

Table 8: Selection issues

This table shows instrumental variable regressions with robust errors and Tobit regressions with censoring at 0 and 1. The dependent variable is the ratio of new firms (defined as age 1- 2) to total firms, averaged over the period 1998-99, by 2-digit NACE industry code and country. Columns (i-v) show instrumental variable regressions. We use the legal origin variable in LSSV (1998) as instrument for entry regulations. We use clustering to correct the standard errors for the fact that the country level variables are instrumented. Columns (vi-vii) show Tobit results when we estimate different slopes for the interaction variables for whether the industry is in a country below or above the sample-median per capita income (low GDP per capita and high GDP per capita, respectively), or above or below sample-median level of corruption (high corruption and low corruption, respectively). All regressions include a constant, country dummies and 2-digit industry dummies, not shown. See Table 6 and Appendix 1 for complete variable definitions and sources. Standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
	Instrumental variables					Different slopes	
Industry Share	-0.092	-0.087	-0.088	-0.085	-0.085	-0.110	-0.117
	(0.090)	(0.093)	(0.092)	(0.094)	(0.093)	(0.108)	(0.108)
EntryUS * EntCost	-0.175***						
	(0.055)						
Scale * EntCost		0.002***					
		(0.000)					
Size * EntCost			0.002***				
			(0.001)				
Conc * EntCost				0.004*			
				(0.002)			
HH * EntCost					0.002***		
					(0.000)		
Low GDP per capita * EntryUS * EntryCost						0.087	
						(0.127)	
High GDP per capita * EntryUS * EntryCost						-0.170***	
						(0.047)	
High corruption * EntryUS * EntryCost							0.186
							(0.128)
Low Corruption * EntryUS * EntryCost							-0.168***
							(0.047)
Observations	708	708	708	708	708	708	708
R-squared	0.59	0.59	0.59	0.58	0.58	-	-

Table 9: Summary statistics and correlations of variables

Panel A: Summary statistics of country-level variables

This table shows summary statistics of country-level variables. See Appendix 1 for complete variable definitions and sources.

Variable	(i) Number of countries	(ii) Mean	(iii) Median	(iv) Std. Dev.	(v) Min	(vi) Max
Entry cost (EntryCost)	20	0.20	0.15	0.21	0.01	0.86
Cost of labor dismissals (LabCost)	16	1.92	1.90	0.93	0.50	4.20
Employment laws (EmpLaw)	20	1.55	1.68	0.36	0.80	2.18
Intellectual property rights (IntProp)	21	5.00	5.30	1.27	2.90	6.60
Financial development (FinDev)	21	1.07	0.96	0.75	0.11	2.79
Accounting (AccStan)	13	0.67	0.64	0.09	0.54	0.83
Human capital (Edu)	21	8.82	9.24	1.17	6.09	10.85

Panel B: Summary statistics of U.S. industry-level variables, by industry

This table shows summary statistics of U.S. industry-level characteristics. The variables are calculated using the Dunn & Bradstreet databases of U.S. corporations and the CompuStat database of U.S. listed firms. See Appendix 1 for complete variable definitions and sources. Averages are reported across sector groups based on 2-digit NACE industry codes. See Annex 3 for complete 2-digit NACE U.S. entry and exit rates. We exclude the agricultural, mining, utility, finance, and public sectors and 2-digit industries with less than 3 observations.

Industry	(i) Sector code	(ii) NACE Industry Code	(iii) % of New Firms (EntryUS)	(iv) % of Exited firms (ExitUS)	(v) Total Assets (Scale)	(vi) Total Revenues (Size)	(vii) Concentration ratio (Conc)	(viii) Herfindahl-Hirschman index (HH)	(ix) Labor Intensity (LabInt)	(x) R&D (R&D)	(xi) External Finance (ExtFin)	(xii) Hour Wage (Wage)
Manufacturing	1	15 – 36	6.31	21.71	318.44	385.41	0.44	0.083	23.94	3.15	26.60	13.96
- Manufacture of chemicals		24	6.08	22.43	31.04	17.22	0.23	0.025	11.12	12.68	79.05	16.18
- Manufacture of office machinery and computers		30	8.67	34.23	34.65	40.23	0.52	0.088	54.31	10.35	50.15	22.33
- Manufacture of radio, television, and communication equipment		32	8.45	27.43	42.95	51.69	0.47	0.073	19.61	10.62	32.76	13.67
Construction	2	45	8.14	19.89	97.24	127.54	0.34	0.051	22.27	0.50	46.98	15.42
Trade	3	50 – 52	5.86	20.30	104.70	209.29	0.38	0.077	43.56	0.00	54.79	11.00
Hotels and Restaurants	4	55	5.95	15.88	52.82	62.65	0.41	0.057	95.70	0.00	42.51	7.28
Transportation	5	60 – 63	6.74	24.63	218.34	204.39	0.51	0.104	20.13	7.50	13.01	14.57
Communications	6	64	10.09	31.36	270.85	108.67	0.30	0.036	9.63	2.23	85.58	19.95
Services	7	70 – 74, 93	7.51	20.30	47.76	46.17	0.50	0.107	28.68	10.21	96.87	15.36
- Computer services		72	10.73	25.61	17.85	20.95	0.61	0.135	22.81	17.57	123.86	23.54
Total	1-7	15-93	6.65	21.74	234.23	276.32	0.45	0.086	28.03	4.12	41.00	14.00

Panel C: Correlation of U.S. industry-level variables, by 2-digit NACE code

This table shows correlations and significance levels between U.S. industry characteristics. See Appendix 1 for variable definitions and sources. ***, ** and * asterisk indicate 1%, 5% and 10% significance, respectively.

	EntryUS	R&D	ExtFin	LabInt	Wage
R&D	0.2278				
	(0.1815)				
ExtFin	0.2456	0.8011***			
	(0.1372)	(0.0000)			
LabInt	0.0345	-0.1502	0.1208		
	(0.8540)	(0.4283)	(0.5173)		
Wage	0.2730	0.4178**	0.3557**	-0.3734**	
	(0.1021)	(0.0125)	(0.0307)	(0.0421)	
ExitUS	0.5195***	0.0144	-0.0151	-0.2535	0.3667**
	(0.0008)	(0.9335)	(0.9284)	(0.1688)	(0.0256)

Panel D: Correlation matrix of interaction variables, by 2-digit NACE code and country

This table shows correlations and significance levels of the main regression interaction variables. See Appendix 1 for variable definitions and sources. ** and * asterisk indicate 1% and 5% significance, respectively.

	LabInt * LabCost	LabInt * EmplLaw	R&D * IntProp	ExtFin * FinDev	Wage * Edu
LabInt * EmplLaw	0.6511***				
	(0.0000)				
R&D * IntProp	0.0527	0.0676*			
	(0.2089)	(0.0737)			
ExtFin * FinDev	-0.0108	0.0659*	0.6990***		
	(0.7913)	(0.0742)	(0.0000)		
Wage * Edu	-0.2978***	-0.3110***	0.3644***	0.2181***	
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	
EntryUS * EntCost	0.3105***	0.1155***	-0.1495***	-0.2945***	-0.2363***
	(0.0000)	(0.0017)	(0.0001)	(0.0000)	(0.0000)

Table 10: Other Regulations and the Business Environment

This table shows Tobit regressions with censoring at 0 and 1. The dependent variable is the ratio of new firms (defined as age 1- 2) to total firms, averaged over the period 1998-99, by 2-digit NACE industry code and country. All regressions include a constant, country dummies and 2-digit industry dummies, not shown. See Appendix 1 for complete variable definitions and sources. Industry Share is the industry share in sales. LabInt * LabCost is the interaction of industry-level labor intensity and country-level cost of labor dismissals. LabInt * EmplLaw is the interaction of industry-level labor intensity and country-level employment laws index. R&D * IntProp is the interaction of industry-level R&D intensity and country-level Intellectual property rights. ExtFin * FinDev is the interaction of industry-level external financial dependence and country-level financial development. ExtFin * Account is the interaction of industry-level external financial dependence and country-level accounting standards. Wage * Edu is the interaction of industry-level hourly wages and country-level human capital. EntryUS * EntCost is the interaction of industry-level new entry ratios and country-level entry costs. Standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
Industry Share	-0.007	-0.097	-0.070	-0.059	0.168	-0.029	-0.158
	(0.118)	(0.109)	(0.109)	(0.109)	(0.123)	(0.109)	(0.107)
LabInt * LabCost	-1.297***						
	(0.328)						
LabInt * EmplLaw		-1.886*					-3.011***
		(1.012)					(1.075)
R&D * IntProp			0.097***				0.088***
			(0.022)				(0.027)
ExtFin * FinDev				0.020***			0.004
				(0.005)			(0.006)
ExtFin * AccStan					0.099**		
					(0.039)		
Wage * Edu						0.372	0.280
						(0.370)	(0.377)
EntryUS * EntCost							-0.166***
							(0.053)
Observations	587	708	713	744	484	724	660
R-squared	0.63	0.58	0.60	0.59	0.69	0.59	0.61

Table 11: Comparison between Amadeus data and Eurostat data

Amadeus Entry is the ratio of new firms defined as age 1-2 to total firms, averaged over the period 1998-99, by Eurostat industry code and country, computed using Amadeus data. Eurostat Entry is the ratio of new firms to total firms for the year 1999, computed by Eurostat industry code and country. EuroStat Exit is the exit rate for the year 1999 by Eurostat industry code and country, defined as the number of exited firms, correcting for mergers and acquisitions. D&B Entry is the entry rate in the U.S. in 1999 and D&B Exit is the ratio of exited firms in the U.S. in 1999. Panel A uses 220 observations and Panel B uses 30 observations. Robust standard errors are reported in parentheses. *, **, and *** denote significant at 10%, 5%, and 1%, respectively.

Panel A: Correlations at country-industry level

	Amadeus Entry	Eurostat Entry	Eurostat Exit
Amadeus Entry	1		
Eurostat Entry	***0.6716 (0.0000)	1	
Eurostat Exit	***0.5311 (0.0000)	***0.6373 (0.0000)	1

Panel B: Correlations at 2-digit Eurostat industry-level

	Amadeus Entry	Eurostat Entry	Eurostat Exit	D&B EntryUS	D&B ExitUS
Amadeus Entry	1				
Eurostat Entry	***0.8991 (0.0000)	1			
Eurostat Exit	***0.7048 (0.0000)	***0.8332 (0.0000)	1		
D&B EntryUS	***0.6035 (0.0004)	***0.6767 (0.0000)	***0.6431 (0.0000)	1	
D&B ExitUS	0.2812 (0.1323)	**0.3903 (0.0330)	***0.5013 (0.0048)	***0.5133 (0.0037)	1

Table 12: Determinants of Entry Rates: Eurostat data

This table shows Tobit regressions with censoring at 0 and 1. The dependent variable in columns (i-iii) is the entry rate for the year 1999 by Eurostat industry code and country, defined as the number of new firms divided by the total number of firms. EntryUS* EntCost is the interaction of industry-level new entry ratios and the logarithm of country-level entry costs. Scale * EntCost is the interaction of the logarithm of the median industry total assets and the logarithm of country-level entry costs. Conc * EntCost is the interaction of the logarithm of the industry-level 4-firm concentration ratio (in terms of total revenues) times the logarithm of country-level entry costs. The dependent variable in column (iv) is the exit rate for the year 1999 by Eurostat industry code and country, defined as the number of exited firms, correcting for mergers and acquisitions. Column (v) reports instrumental variables regressions with the dependent variable equal to Entry rates calculated by Eurostat and using legal origins as the instrument for entry cost. Standard errors are reported in parentheses. All regressions include a constant, country dummies and industry dummies, not shown. See Appendix 1 for complete variable definitions and sources. *, **, and *** denote significant at 10%, 5%, and 1%, respectively.

	(i)	(ii)	(iii)	(iv)	(v)
	Tobit Regressions:				Instrumental variables:
	EntryEuro	EntryEuro	EntryEuro	ExitEuro	EntryEuro
EntryUS * EntCost	-0.198***			-0.128***	-0.235***
	(0.043)			(0.027)	(0.065)
Scale * EntCost		0.002***			
		(0.001)			
Conc * EntCost			0.003		
			(0.002)		
Observations	259	259	259	234	259

Figure 1: Difference-in-difference estimates by ordered industries.

This figure presents difference-in-difference (DD) estimates by NACE industry, where the industries are ranked from lowest natural entry (EntryUS) to highest. DD is calculated as follows. We first divide the countries into two groups: High entry regulation (HR) and low entry regulation (LR) – depending on whether the country's entry costs (EntCost) is above or below the sample median – and then rank the industries from the lowest natural entry to the highest. Next, we pick the lowest natural entry industry (LWE) as our reference industry, and compute the difference-in-difference estimate: DD = [J(HR) − LWE(HR)] − [(J(LR) − LWE(LR)], for each remaining industry J. The benchmark industry is manufacture of machinery and equipment n.e.c. (NACE 29), for which $Entry_{US}$ takes a low of 4.30 percent. We plot DD against the ordered industries. We also display the regression line of an OLS regression of DD on $Entry_{US}$. See Annex 1 for the NACE industry names.
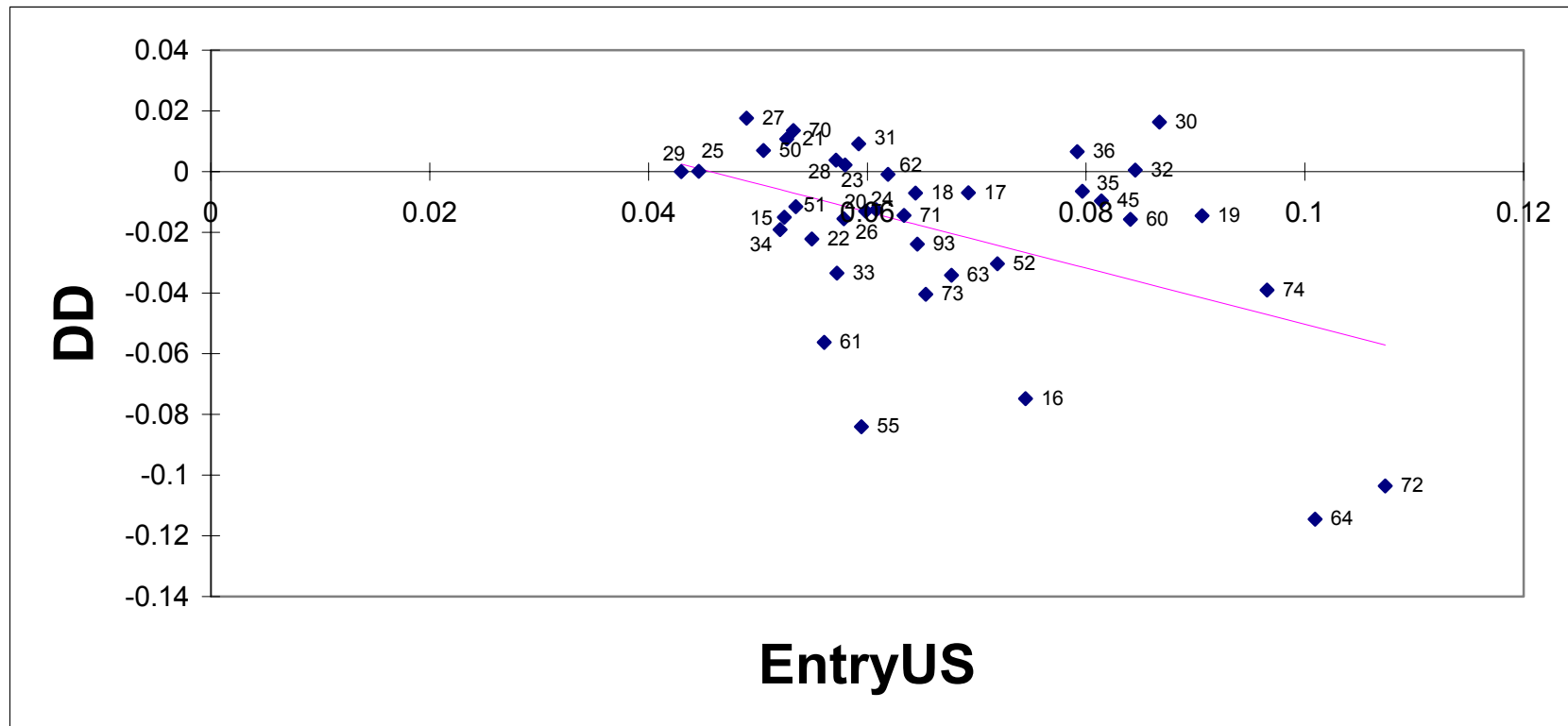
Figure 2: Difference-in-difference estimates by ordered countries.

This figure presents difference-in-difference (DD) estimates by country, where the countries are ranked from lowest entry regulation (EntCost) to highest. DD is calculated as follows. We first divide the industries into two groups: Low entry (LE) and High entry (HE) – depending on whether the industry's U.S. entry rates (Entry$_{US}$) is below or above the sample median – and then order the countries from the highest entry regulation to the lowest. Next, we pick the country with highest entry regulation (HER) as our reference country, and compute the difference-in-difference estimate: DD = [J(LE) – HER(LE)] – [(J(HE) – HER(HE)], for each remaining country J. The benchmark country is Hungary, for which EntCost takes a high of –0.15. We plot DD against the ordered countries. We also display the regression line of an OLS regression of DD on EntCost.
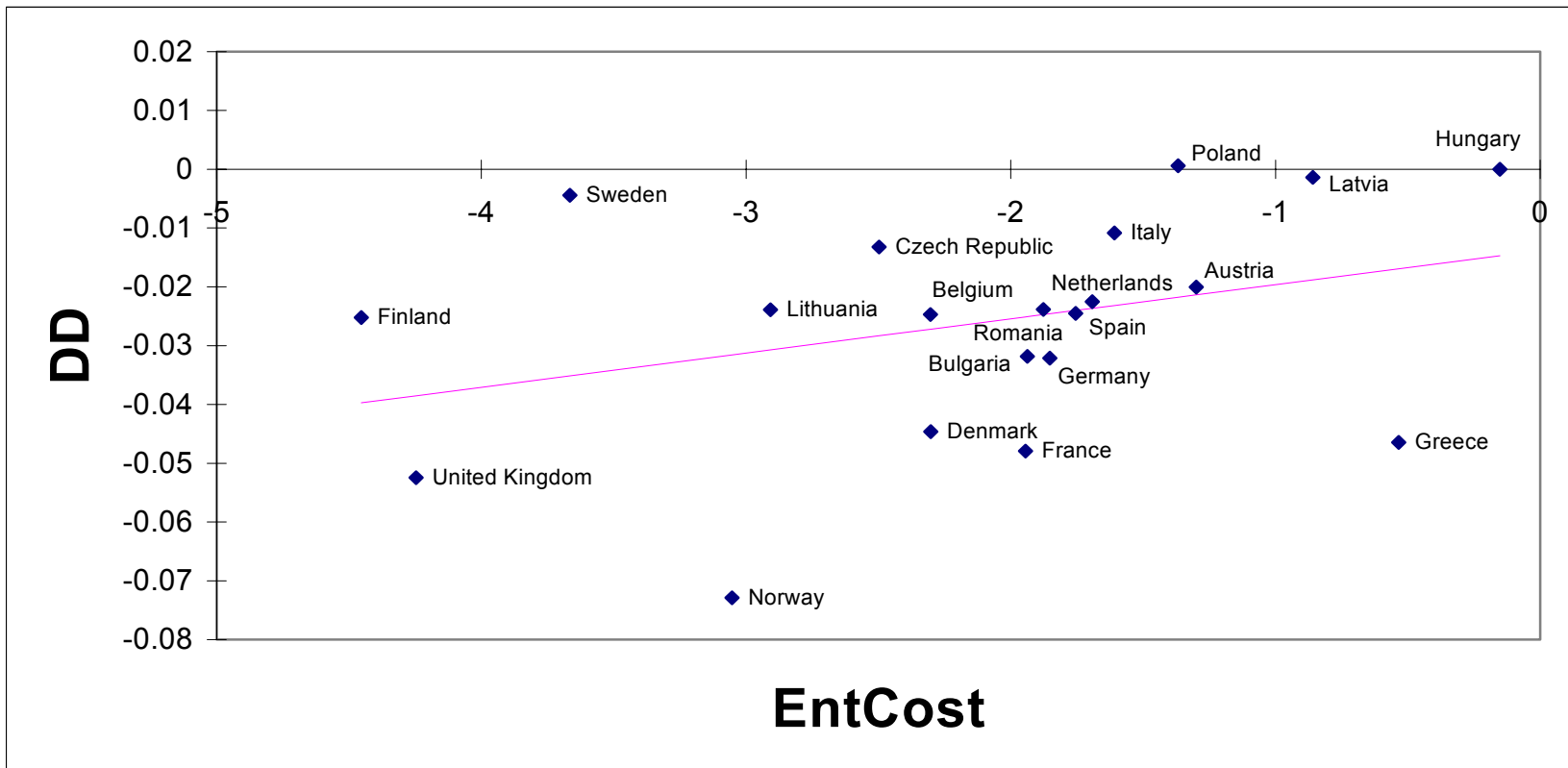
Annex 1: 2-digit level industry codes according to NACE industrial classification Rev. 1.

NACE code	Industry name
01	Agriculture, hunting and related service activities
02	Forestry, logging and related services activities
05	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
10	Mining of coal and lignite; extraction of peat
11	Extraction of crude petroleum and natural gas
12	Mining of uranium and thorium ores
13	Mining of metal ores
14	Other mining and quarrying
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Manufacture of luggage, handbags, saddlery and footwear
20	Manufacture of wood and of products of wood and cork, except furniture
21	Manufacture of pulp, paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products and nuclear fuel
24	Manufacture of chemicals, and chemical products
25	Manufacture of rubber and plastic products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products, except machinery and equipment
29	Manufacture of machinery and equipment not elsewhere classified
30	Manufacture of office machinery and computers
31	Manufacture of electrical machinery and apparatus not elsewhere classified
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing not elsewhere classified
37	Recycling
40	Electricity, gas, steam and hot water supply
41	Collection, purification and distribution of water
45	Construction
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles
52	Retail trade, except of motor vehicles and motorcycles
55	Hotels and restaurants
60	Land transport; transport via pipelines
61	Water transport
62	Air transport
63	Supporting and auxiliary transport activities; activities of travel agencies
64	Post and telecommunications
65	Financial intermediation, except insurance and pension funding
66	Insurance and pension funding, except compulsory social security
67	Activities auxiliary to financial intermediation
70	Real estate activities
71	Renting of machinery and equipment without operator and of personal and household goods
72	Computer and related activities
73	Research and development
74	Other business activities
75	Public administration and defense; compulsory social security
80	Education
85	Health and social work
90	Sewage and refuse disposal, sanitation and similar activities
91	Activities of membership organization not elsewhere classified
92	Recreational, cultural and sporting activities
93	Other services activities
95	Private household with employed persons
99	Extra-territorial organizations and bodies

Annex 2: Details about collection of company accounts in Amadeus

Country	Which companies have to file accounts?	Are all public and private limited companies required to file accounts ?	What is the maximum period a company can take to file its accounts after its year end ?	What is the maximum period between a company filing its accounts and the records appearing on the database ?
Austria	Public limited companies (AG) and private limited companies (GmbH)	Yes	12 months	3 months
Belgium	All public limited companies (SA/NV) companies, private limited companies (SPRL/BV/BVBA), partnerships (SNC/VOF/SCS/GCV/SCA/CVA), cooperatives (SC/CV), and European Economic Interest Groupings (EEIG)	Yes	7 months	3 months
Bulgaria	Joint Stock companies (EAD) are required to publish their annual balance sheet in a newspaper and in a Court Trade Register. However, the compliance rate is very low as companies prefer to pay a fine in order to avoid publishing their financials. The requirements of submitting financials to the Court Trade Register commenced in 2002. It is not compulsory for all other company types to officially present their financial statements.	No, only public limited companies, although accounts are available from tax authorities.	n.a.	n.a.
Czech Republic	Joint stock companies, limited liability companies and cooperatives. Limited liability companies and cooperatives only if they meet at least one of the following two legal conditions in the previous year: equity more than CZK 20 million and turnover more than CZK 40 million.	No, only if they meet at least one of the following two conditions: equity > CZK 20 million and turnover > CZK 40 million.	6 months	4-5 weeks
Denmark	All public limited companies (A/S), private limited companies (ApS), and limited partnerships by shares (P/S). Also some limited and general partnerships and profit associations and foundations. However, there are some very complicated and detailed legal exceptions to these rules.	Yes	Within 6 months (5 months for public limited companies).	Less than 20 days, but with exceptions.
Estonia	Public limited companies, private limited companies, and cooperatives.	Yes	6 months	12 months
Finland	All joint-stock companies and all cooperatives that meet two of the following three conditions: turnover exceeds FIM 20 million, balance sheet total exceeds FIM 10 million, the average number of employees is over 50		8 months	n.a.
France	All public limited companies (SA), private limited companies (SARL), limited partnerships (SCS), general partnerships of which the partners are not individuals (SNC), and sole proprietorships with limited liability (EURL)	Yes	6 months (4 months for listed companies)	4 months
Germany	Public limited companies (AG), private limited companies (GmbH), and registered cooperative societies ("eingetragene Genossenschaft", e.G.)	Yes	12 months	4-6 weeks
Greece	Public and private limited companies (SA)	Yes	6 months	20-40 days
Hungary	All companies, except proprietorships.	Yes	5 months	n.a.

Iceland	All public limited companies (HF), private limited companies (EHF), general cooperatives (SVF). Partnerships and agricultural cooperatives (Samlagsfelag) only if they fulfill two out of the three following prerequisites: total assets over ISK 200 mln , operating revenue over ISK 400 mln, and average number of employees over 50.	Yes	8 months	6 weeks
Ireland	Public limited companies (plc) and private limited companies (ltd).	Yes	46 days	n.a.
Italy	Public limited companies (S.p.A.) and private limited companies (S.r.l.).	Yes	6 months	5 months
Latvia	All companies, except sole proprietor enterprises and peasant farms, whose annual turnover does not exceed LVL 45,000 (EUR 82,000).	Yes	From 4 to 10 months	9 months
Lithuania	All companies.	Yes	5 months	n.a.
Luxembourg	Public limited companies (S.A.), private limited companies (S.A.R.L.) and cooperative companies (S.C.)	Yes	6 months	2 months
Netherlands	Public limited companies (NV) and private limited companies (BV).	Yes	15 months	
Norway	All limited liability companies. Unlimited liability entities only if turnover exceeds NOK 2 million.	Yes	6 months	2 months
Poland	All joint stock companies, limited liability companies, and partnerships with the following criteria: employees over 50, total assets over EURO 1 million, and net profit over EURO 3 million.	Only if: employees > 50, total assets > 1 million Euro, and net profit > 3 million Euro.	9 months	n.a.
Portugal	All joint-stock companies and private limited companies.	Yes	6 months	2 months
Romania	Joint stock companies, limited liability companies, and partnerships limited by shares.	Yes	2.5 months	4 months
Slovak Republic	All joint stock companies (a.s.), limited liability companies (s.r.o.), and cooperatives if they meet two of the following three conditions in the previous year: Equity (total assets) > 20 mil. SKK, turnover (operating revenue and sales) > 40 mil. SKK, and average number of employees > 20.		12 months	4-5 weeks
Slovenia	All companies.	Yes	3 months	4 months for joint stock companies, 2 months for other companies
Spain	All public limited companies (S.A.), private limited companies (S.L.) and limited partnerships	Yes	7 months	n.a.
Sweden	All public and private limited companies (AB).	Yes	6 months	n.a.
Switzerland	There are no legal requirements to file accounts. Listed public limited corporations (AG/SA) must file accounts to the stock exchange and publish annual audited financial results in the official gazette. Private limited companies (GmbH/Sarl) have no obligatory filings.	No		3 months
United Kingdom	Public limited companies (plc) and private limited companies (ltd)	Yes	10 months for ltd's and 7 months for plc's	10 weeks

Source: Amadeus, Bureau Van Dijk (supplemented with Dunn & Bradstreet information for Bulgaria, Iceland, and Ireland using D&B Country Report Guides), and Primark Capital Markets Guide 1999. Note: Data excludes proprietorships in all countries.

Annex 3: U.S. entry and exit rates, by 2-digit NACE code

Sample of all U.S. corporations. The source for all data is Dunn & Bradstreet. All data is for 2001. *NewFirm* is the percentage of new corporations, defined as firms of age 0-2. *NewEmp* is the percentage of employment at new firms. *Exit* is the percentage of firms that exited the sample over the same period, including closures and acquisitions. *Bankrupt* is the percentage of firms that exited following formal bankruptcy proceedings.

NACE	Industry	NewFirm	NewEmp	Exit	Bankrupt
10	Mining of coal and lignite; extraction of peat	3.05	1.02	30.32	4.08
11	Extraction of crude petroleum and natural gas	4.45	1.09	22.37	1.35
13	Mining of metal ores	3.41	0.44	31.54	2.86
14	Other mining and quarrying	3.73	0.99	20.68	1.39
15	Manufacture of food products and beverages	5.24	0.79	20.43	1.91
16	Manufacture of tobacco products	7.45	0.34	26.89	1.40
17	Manufacture of textiles	6.92	1.22	20.97	2.46
18	Manufacture of wearing apparel; fur	6.44	1.32	28.12	3.03
19	Manufacture of luggage, handbags, and footwear	9.06	2.40	23.16	2.51
20	Manufacture of wood, except furniture	5.98	1.35	20.89	3.29
21	Manufacture of pulp, paper and paper products	5.26	6.84	23.24	1.87
22	Publishing, printing, and recorded media	5.49	1.26	19.06	2.14
23	Manufacture of coke and petroleum products	5.80	0.25	26.57	0.81
24	Manufacture of chemicals, and chemical products	6.08	1.51	22.43	1.45
25	Manufacture of rubber and plastic products	4.46	0.93	17.27	1.79
26	Manufacture of non-metallic mineral products	5.79	0.90	18.92	1.74
27	Manufacture of basic metals	4.90	2.79	18.81	2.13
28	Manufacture of fabricated metal products	5.71	1.13	16.29	1.98
29	Manufacture of machinery and equipment n.e.c.	4.30	1.26	15.76	1.74
30	Manufacture of office machinery and computers	8.67	1.28	34.23	2.20
31	Manufacture of electrical machinery	5.92	1.11	20.13	1.52
32	Manufacture of communication equipment	8.45	2.07	27.43	2.27
33	Manufacture of instruments, watches and clocks	5.72	2.14	16.68	1.45
34	Manufacture of motor vehicles and trailers	5.20	1.05	21.61	2.42
35	Manufacture of other transport equipment	7.96	1.15	19.61	2.18
36	Manufacture of furniture; manufacturing n.e.c.	7.92	2.18	19.15	2.33
40	Electricity, gas, steam and hot water supply	5.56	2.41	33.60	0.88
41	Collection, purification and distribution of water	1.74	0.46	8.34	0.28
45	Construction	8.14	3.00	19.89	4.14
50	Sale, maintenance and repair of motor vehicles	5.05	1.88	17.06	2.74
51	Wholesale trade and commission trade	5.35	2.09	20.90	1.54
52	Retail trade, except of motor vehicles	7.19	1.50	22.92	2.81
55	Hotels and restaurants	5.95	1.53	15.88	2.54
60	Land transport; transport via pipelines	8.41	2.80	27.82	7.68
61	Water transport	5.61	1.83	19.47	1.95
62	Air transport	6.19	0.69	30.27	1.75
63	Supporting and auxiliary transport activities	6.77	1.60	20.96	1.67
64	Post and telecommunications	10.09	1.36	31.36	2.14
70	Real estate activities	5.33	2.19	17.04	1.56
71	Renting of machinery and equipment	6.34	1.57	27.09	1.93
72	Computer and related activities	10.73	3.34	25.61	1.91
73	Research and development	6.53	1.28	17.01	0.93
74	Other business activities	9.65	3.09	19.66	4.60
85	Health and social work	2.83	0.78	10.36	1.51
90	Sewage and refuse disposal and sanitation	5.43	1.44	21.07	2.22
92	Recreational, cultural and sporting activities	6.46	2.31	14.25	2.35
93	Other services activities	6.46	3.24	15.37	3.67

Annex 4: Legal forms in Europe

Country	Public Limited Company	Private Limited Company
Austria	Aktiengesellschaft (AG)	Gesellschaft mit beschraekter Haftung (GmbH)
Belgium	Naamloze Vennootschap (NV), Société Anonyme (SA)	Besloten Vennootschap (BVBA), Société Privée a Responsabilité Limite (SPRL), EBVBA/SPRLU
Bulgaria	AD or EAD	OOD or EOOD
Czech Republic	AS	SRO
Denmark	A/S	ApS
Estonia	AS	OÜ
Finland	OYJ	OY
France	Société Anonyme (SA)	Société a Responsabilité Limite (SARL)
Germany	Aktiengesellschaft (AG)	Gesellschaft mit beschraekter Haftung (GmbH)
Greece	SA or AE	EPE
Hungary	RT	Kft
Ireland	Public Limited Company (PLC)	Private Limited Company (LTD)
Italy	Societa Per Azioni (SPA)	Societa a Responsabilita Limitata (SRL)
Latvia	AS	SIA
Lithuania	Aktiengesellschaft (AG)	Gesellschaft mit beschraekter Haftung (GmbH)
Luxembourg	Société Anonyme (SA)	Société a Responsabilité Limite (SARL)
Netherlands	Naamloze Vennootschap (NV)	Besloten Vennootschap (BV)
Norway	AS	AS
Poland	SA	Sp. zoo.
Portugal	Sociedade Anónima (SA)	Sociedade por Quotas Responsibilidada Limitada (LDA)
Romania	SA	SRL
Slovak Republic	AS	SRO
Spain	Sociedad Anónima (SA)	Sociedad Limitada (SL)
Sweden	A B (public limited)	A B (private limited)
Switzerland	Aktiengesellschaft (AG), Société Anonyme (SA)	Gesellschaft mit beschraekter Haftung (GmbH), Société a Responsabilité Limite (SARL)
United Kingdom	Public Limited Company (PLC)	Private Limited Company (LTD)