Documenting Data on High-growth Firms and Entrepreneurs across 17 Countries

FIRST DRAFT

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Abstract: The EU Commission has identified the "creation of more high-growth firms" as one of key challenges facing the EU at this time. However, the necessary statistics, even the most elementary data, relating to the challenge are currently available. For example, it is not known whether a larger share of US firms than the EU firms become high-growth firms. Furthermore, little is known about the differences among the EU countries and even less about the differences between the EU and Asian countries. The purpose of this paper is to provide some answers to these crucial policy questions by calculating the number of high-growth firms in 17 countries based on a unique international database of business accounts. The main focus of the paper is on new firms (entrepreneurs), but data is included on all age groups. Moreover, the paper documents the database and examines a large number of problems related to firm data analysis and some of the important issues relating to cross-country comparisons; i.e. defining high growth, mergers and acquirers, censoring, consolidated/unconsolidated statements and choice of deflator. Finally, an extensive sensitivity analysis are carried out in order to provide readers with an idea of the relative importance of the applied definitions/assumptions and to check the robustness of the paper's results.

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1. Introduction

The EU Commission's Green Paper on Entrepreneurship identified two fundamental issues for Europe: 'How to produce more entrepreneurs' and 'How to produce more high-growth firms' (EU, 2003). However, more data is needed in order to support policy formulation in these two areas. A low number of high-growth firms in Europe could be due to a lack of new firms in general or a lack of growth among the new firms. David Birch's seminal work on gazelles in the US showed, for example, that around 3 % of all new firms become gazelles (Birch D. 1995). Can one assume that the number is the same in Europe or Asia?

The objective of this paper is to compute indicators measuring high-growth firms across 17 countries in order to provide the basis for fact-based policy formulation in the EU. One of the main points of the paper is that there is a major difference between Europe and the US with regard to the share of new firms that experience high growth. European firms simply do not grow as fast as US firms. The policy implication of this result for Europe is clear. Europe should focus on getting more firms to grow by improving the business environment for high-growth firms and NOT on stimulating more entry of new firms.

Calculating and comparing the share of high-growth firms across countries is difficult. The difficulties relate mainly to i) getting internationally comparable data; and ii) defining high-growth firms and high-growth entrepreneurs.

The data in this paper is comes from two databases - ORBIS and AMADEUS – provided by the electronic publishing company, Bureau van Dijk (BvD). At the moment, these databases are the best available for this paper's analysis as researchers are currently without access to register or census data in other countries.[3] These databases have been used by several other researchers (see for example, Desai, Gompers and Lerner, 2003).

[3] Bartelsman *et al* (2006) are presently working on what the authors call a distributed database. They have contact researchers, who have access to firm register data in more than 20 countries. So they have the potential to go beyond data like those from BvD in some countries. In other countries, for example Denmark and Germany, they rely on the same data as this paper.

Despite the extensive use of the database, several problems relating to the representativity and purity of the data remain unresolved. The purity problems relate to the treatment of mergers and acquisitions, censoring, consolidated/unconsolidated statements and listed/unlisted firms; this is particularly pronounced when it comes to comparing US and Europe. These issues are discussed in this paper, although solutions have not been found for all of them. The representativity of the data is also examined in this paper.

No internationally accepted definition exists of what constitutes a high-growth firm. The literature offers several definitions inspired by the work of David Birch (Birch, 1987). This paper defines a high-growth firm as a firm with a growth rate (in either employment or turnover) higher than 60 per cent in the period from t to t+2. Furthermore, this definition requires a positive growth in both time periods of at least 20%.

An extensive sensitivity analysis is performed on both the quality and representativity of the data and alternative definitions of high growth. On the one hand, the sensitivity tests show that the results are somewhat sensitive to changes in what can be controlled for in the data, although the US always has a significantly higher share of high-growth firms than EU countries. Only the ranking among the EU countries is affected by the various sensitivity tests. On the other hand, the results are very robust with respect to changes in the definitions of high growth.[4]

Few other papers have examined the differences in the share of high-growth firms across countries simply due to the lack of available data. The OECD has in large study based on microdata analysed growth among firms, although it did not directly address high-growth firms (Scarpetta, *et al*, 2002; Bartelsmans *et al*, 2003). The OECD has also addressed in employment impact of high-growth firms (OECD, 2002). The Global Entrepreneurship Monitor (GEM) has also addressed the issue of high growth (Marraskuu, 2005). Both studies find results that are comparable with the results of this paper. Indeed, this paper

[4] Not all of the descriptive and sensitivity analyses are reported in this paper but are available upon request from the authors.

also finds similar results to David Birch's gazelle study when his definition is applied (Birch, 1995).

The databases used in this paper cover 25 countries. However, only 17 of these countries are included in this paper (Austria, Belgium, Denmark, Finland, France, Germany, Italy, Japan, Korea, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK and the US). Switzerland and Portugal were almost included, but they were excluded due to small sample sizes. Four countries (Australia, Canada, New Zealand and Singapore) are excluded due to the small number of observations. The results for the last four countries (Greece, Hungary, Poland and Ireland[5]) are not reported in this paper due to some unexplained abnormalities in the data.[6]

2. Data and Definitions

This section discusses the data, the data's representivity with respect to size classes and legal forms and the applied definitions of high-growth firms.

2.1 The data

The data are from the electronic publishing company Bureau van Dijk (BVD) and known under its commercial name, ORBIS.[7] The database has financial information for more than 16 million companies around the world. The information is catalogued from more than 40 different information providers, which has been to some extent standardised. As well as descriptive information and company financials, ORBIS contains further details such as news, market research, ratings and country reports, scanned reports, ownership and M&A data. This information is utilised in the sensitivity analyses.

Firms are tracked through time by a unique identifier given to each firm in the database. Unfortunately, data is sometimes compiled at the establishment level or at the firm level.

[5] Ireland can only be analysed with respect to turnover. The number of employee distribution is inflated with zeros.
[6] The results of the last four countries are available on request
[7] The current source is ORBIS. But the ORBIS data has been merged with AMADEUS for the year up to 2004.

Annual reports are, for the same reason, given as consolidated and unconsolidated. The tracking of firms/establishments through time is linked to the BvD's local information provider. For example, the VAT ID of firms is used in many countries.

Table 1 shows descriptive statistics for selected variables in the database. The first column indicates the number of firms in the database. The second column is the number of firms with turnover information. Not all firms have information on turnover in 2002 (i.e. for Austria, 160,888 firms are in the database, but only 39,859 filed turnover in 2002). Multiple reasons can be provided. First, the firm might not exist in 2002. Second, the firm did not meet the inclusion criterion (discussed later). Finally, some firms do not have to file all information. The lack of information is of course problematic. A classical approach would be to impute the missing values from other information, but sometimes only 0.7 percent (the Netherlands) is available and imputation of missing data is almost impossible in such circumstances. Instead, the information available on both turnover and number of employees was used[8]. While there are reasons for finding both measures interesting when we look at high growth firms from an economic perspective, there is also a valid statistical reason to look at both turnover and number of employees. Table 1 illustrates that some of the heterogeneity is present in the data. Firms by filing date of incorporation (age) are very different between countries and the same applies to the initial size of the firm. This report will concentrate on young medium sized firms to remedy this problem.

[8] Turnover and number of employees are the core variables in this analysis. The measurement can be different across countries. The BvD has, through the standardisation of company accounts, tried to define turnover and number of employees across countries in the same way.

Table 1: Descriptive Statistics[9]

	Total	Firms reporting turnover		Firms reporting number of employees		Firms reporting age	
Country	Number	Number	Median	Number	Median	Number	Median
Austria	160888	39859	1067	45360	6	160294	9
Belgium	412401	102698	213	105553	3	400818	10
Denmark	165799	32661	236	56111	5	160899	7
Finland	97496	69860	252	43143	4	95678	12
France	1086178	770166	308	737725	2	1083111	9
Germany	1018570	506628	986	536874	6	1012346	11
Italy	565924	257164	1463	256872	6	162332	19
Japan	388501	176592	2970	175635	11	387639	25
Korea	14642	12933	14002	11276	65	14610	12
Netherlands	1787575	13282	8101	136267	3	1517462	8
Norway	182455	119565	318	81584	4	180167	9
Portugal	102734	42992	372	1514	48	101210	12
Spain	897022	642343	271	452036	5	895858	9
Sweden	276374	214587	231	177683	3	276139	12
Switzerland	35561	3274	25238	20940	8	34234	24
UK	3007305	310410	185	110538	22	2997082	4
US	1531297	43177	3000	45631	33	1430068	17

Source: The BvD.

2.2 Representativity of the Database

The representativity of the database varies significantly across the included countries. Junge and Kaiser (2004) show that the collection of data is very heterogenous across countries. The information on firm dynamics (start-up and exist rates) is not very informative in the database, whereas continuing firms are more homogenous across countries and less influenced by the inclusion criteria.

In principal, the databases cover all firms but the tests show that firms with less than 15 employees are underrepresented in the data. Therefore, this paper requires that firms must belong to the size class of 15 to 200 employees in order to be included in the sample. The 15 employee threshold does limit the number of firms that are picked-up although the 15 employees threshold does have some advantages. Many European countries have labour

[9] The BvD publishes data continuously. The paper uses ORBIS update of 3 January 2006. For the European countries, the BvD firm indicator variable was merged with older records from AMADEUS of January 2005.

market regulation that take effect at 15 employees and thereby create problems in comparing growth in smaller firms.

This paper introduces a sub-sample of high-growth firms, referred to as young firms. For young firms, there is the added requirement that the firms are born within the last 5 years from year t. The main emphasis in the paper will be on the young firms.

The amount of information a firm needs to file depends on its size and legal form, so the main problems are attached to these two dimensions. As the focus is on young firms, it is important to know the representativity of young firms in the various size classes. But getting the joint distribution of firm's age and size classes is not feasible at the moment for the many countries that are studied.

Size Classes

The coverage rate is quite good for many European countries in the 20+ size class, whereas the non-European countries are less representative in all size classes (**Table 2**). For example, the database includes more than 60% of all Austrian firms in manufacturing[10] and more than 90% of all Danish firms in the 20+ size class. For very small firms (1-4 employees), the coverage rates are very poor in all countries with the exception of Norway and Sweden. Small firms (5-19 employees) have better coverage for most European countries except for Portugal and the Netherlands. Japan and the US are rather unrepresented in all size classes and, therefore, care must be exercised in analyzing the data. No information exists on Korea, but the number of Korean firms (only around 14000 firms) included in this sample suggest that caution should be exercised also in respect to Korean results.

[10] Table 2 covers only manufacturing. This is not because we only include manufacturing in our analysis, all private business sectors are included.

Table 2: The BvD Coverage Rates in Different Size Classes, Manufacturing (2001)

Country	1 to 4	5 to 19	20+
Austria**	0,09	0,68	0,62
Belgium*	0,47	0,63	0,80
Denmark	0,33	0,74	0,93
Finland	0,28	0,60	0,82
France**	0,11	0,45	0,59
Germany**	0,19	0,35	0,72
Italy	0,04	0,16	0,61
Japan***	0,00	0,01	0,03
Korea	.	.	.
Netherlands	0,02	0,02	0,30
Norway	0,62	0,92	0,94
Portugal	0,00	0,00	0,04
Spain	0,18	0,50	0,66
Sweden	0,73	0,80	0,83
Switzerland	.	.	.
UK	0,02	0,05	0,58
US****	0,00	0,00	0,02

Source: The BvD, Eurostat, 2001, Business Demography and Annual Enterprise Statistics broken down by size classes; Establishment and Enterprise Census in Japan; US Census Bureau, Statistics of US Businesses

Note: The number of firms in the sample is related to the number of firms taken from the official figures from National Statistical Offices in the different size classes in manufacturing. * 2000, ** size classes 1-9, 10-19, 20+, *** size classes 0-4, 5-19, 20+, **** OSIRIS numbers.

To limit the problems caused by the difference in coverage rates across countries, this analysis focuses on firms with 15-200 employees. The lower bound is chosen for various reasons. First, Table 2 shows that the analysis will need to address the differences in coverage for small firms, and secondly, one of the BvD's standard products (the top 4 million database) has 15 employees as the lowest common denominator across countries[11]. Furthermore, for the purpose of this analysis it was decided to remove the larger firms (above 200 employees[12]) from the sample.

[11] This data goes through an auditing process to guarantee high quality data.

[12] The authors have experimented with the upper bound, which showed that using 100 or 500 did not change the results (Junge and Kaiser, 2004).

Legal forms

Limited companies are obliged to submit financial statements and are thereby included in our database (**Table 3**). Sole proprietorships are not included for most countries, which is clearly related to the size distribution as these firms that are in general quite small.

Table 3: The Inclusion Criteria for the European Countries[13]

Country	**Legal form**	**Threshold**
Austria	AG, Gmph,very large companies	None
Denmark	A/S, Aps, P/S	None
Finland	All joint-stock, all cooperatives	turnover > 20 Mill.FM or #employees > 50
France	SA, SARL, SCA, SCACS, SAS, EURL, SA DIR, SNC	None
Germany	AG, GmbH, e.G.	None
Italy	S.p.A., S.r.l.	None
Japan	Listed firms, and in principle all sorts	Medium and small sometimes dispensable
Korea	Stock company	Assets > 7. billion Won
Netherlands	All companies	None
Norway	Limited companies	None
Portugal	All companies	None, but most pay fine
Spain	S.A., S.L. and limited companies	None
Sweden	Limited companies	None
Switzerland	None, public quoted	None
UK	Limited companies	None
US	Listed companies	None

Source: The BvD, ORBIS database.

The lack of sole proprietorships in the sample is not a concern given the sample has been limited to only include 15+ employees firms.

Overall, representativity is a concern in this database but by focusing on the 15+ employees firms gives a higher representativity with more than 60% of all existing firms for the included European countries, except for the Netherlands and Portugal. The data for Korea, Japan and the US is still a very small sample of the existing firms, despite the focus on larger firms. A more representative dataset is available for 2003-04 for the US.

[13] OSIRIS are listed firms so the coverage of legal form is not discussed here.

The analysis further tests how a growth indicator on this extended sample compares to the main results of this paper. Currently, no solution exists with respect to Japan.

2.3 Defining high-growth

No internationally accepted definition exists of what constitutes a high-growth firm. The literature offers several definitions inspired by the seminal work of David Birch (Birch, 1987). In some countries, a high-growth firm doubles their employment in a five year period. According to the OECD, high-growth firms are, by definition, the 10 per cent fastest growing firms in the economy (OECD, 2002).

For the purposes of the required analysis, this paper defines high-growth firms as the share of firms with a growth rate (in either employment or turnover) higher than 60 per cent over a three year period (from t to t+2). Furthermore, this definition requires a positive growth of at least 20% in the both time periods (t to t+1 and t+1 to t+2). The requirement of a positive growth rate of at least 20% is based on Birch work on gazelles (Birch, 1996). This requirement ensures that firms with constant growth are included in the analysis and not firms that due to changes in owner structure or other external events have a very high growth in one year and then no growth in the following year. The 60 per cent threshold is commonly used, but is not based on any hard evidence. Both turnover and employment are used as a measure of high growth due to the differences in growth patterns across sectors. Knowledge-intensive manufacturing firms grow both in employment and in turnover, whereas service sector firms mainly have high employment growth (Delmar *et al*, 2003).

This analysis uses a shorter time period than the Birch study, as it normalises the number high-growth firms with the number of continuing firms[14] (i.e. active in period t, t+1, t+2) in the sample for each country. Reducing the time period from Birch's five year to three years increases the sample size substantially.

[14] It is possible to measure the growth in turnover or number of employees for surviving firms and in the future these firms will be included the analysis.

Growth in turnover has to be deflated due to differences in inflation rates across countries and industries. Since this analysis compares growth rates across countries, it does not concern itself with the corrections for price levels,[15] but rather deflates by aggregating country consumer price indices. Ideally, it would also deflate by producer prices by industry, which is an area for further work.[16]

The normalised number of high-growth firms is labeled the *crude indicator*.

Extensive sensitivity analyses are performed both on the thresholds and on the definitions used (both for the numerator and denominator).

3. Results

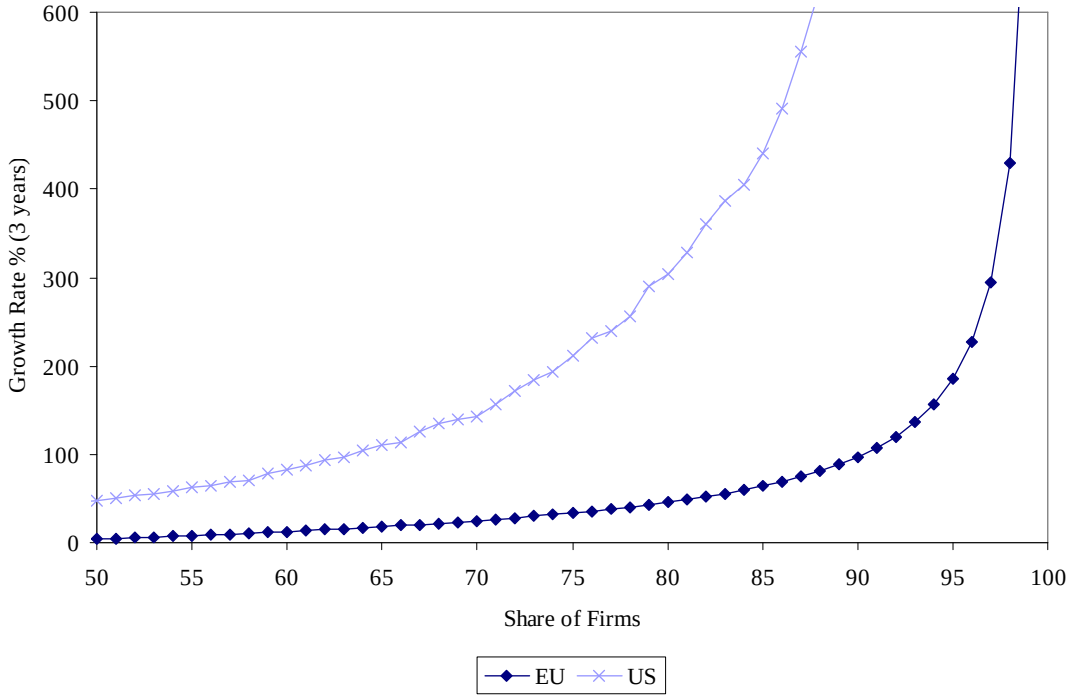
A first look at the distribution function of growth rates from t to t+2 in young firms (born 5 years before t)[17] for US and Europe shows significant differences in the proportion of high growth firms in US and in Europe.

[15] In Table 1, a common exchange rate (USD) was used to compare turnover across countries. This is known to be a poor conversion factor for price levels because it is impacted by short term fluctuations in capital markets and only applicable on traded goods. It is common to compare real growth rates ignoring the issue of correction for price level differences.

[16] The authors are currently working on this possibility.

[17] The year a firm is born statements can be difficult to compare with firms of age two and more. For instance employment is often reported to 0 and turnover relates to a shorter period than a year in period t for a firm born in period t. For this reason we compared results for a sample with firms born from t-5 to t with a sample of firms born between t-6 and t-1. For cross country differences it did not matter.

Figure 1 Comparing Firm Growth in the US and Europe for youngs firms



Note: 'Europe' is an average of the distribution functions in Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and UK.

Applying this paper's definitions of high growth confirm the differences among EU countries and the US. Korea, the US and the UK are among the best performers for generating high-growth firms, as defined by both in employment and turnover (Figure 2). Korea has the highest share of high-growth firms in all periods (4½-7% of all Korean firms are high-growth firms in employment). The Korean numbers seem biased as their share of high-growth firms is much higher than the other countries. The US is performing well on both employment and turnover growth.

The average share of US high-growth firms in turnover is around 8.3% (Figure 2). This number is comparable to the original Birch results, which found that around 3% of US firms are gazelles (Birch, 1995). Birch had a longer time period (five years from 1990-1994) and a different cut-off point ($100,000 in turnover). Appling Birch's definition to

this data shows that the share of gazelles in the database is 3.2% for the time period 1999-2003.

The US has on average twice as many high-growth firms than the European countries. The UK is the best performing European country in most years followed by Spain.

Figure 2: Percent of High-growth Firms , Employment (Period t to t+2)

	Employment			Turnover		
	1999	2000	2001	1999	2000	2001
Austria	0.13	0.06	0.51	2.06	1.40	1.36
Belgium	2.22	1.42	0.95	3.64	2.26	2.26
Denmark	2.05	1.48	1.37	4.60	3.22	3.07
Finland	2.87	1.51	1.37	5.26	3.52	3.19
France	1.92	1.19	0.98	3.56	2.47	2.09
Germany	0.55	0.38	0.43	1.72	1.39	1.23
Italy	3.85	2.28	2.03	4.20	2.95	2.43
Japan	0.35	0.41	0.55	2.17	2.00	2.42
Korea	7.18	4.64	4.90	24.38	17.36	16.64
Netherlands	1.50	1.38	0.82	4.96	3.25	2.50
Norway	1.34	1.26	0.87	3.75	3.24	2.77
Portugal	4.71	1.44	1.37	6.36	3.14	1.26
Spain	2.40	2.07	1.90	6.19	5.23	4.93
Sweden	2.86	2.04	1.63	5.37	3.82	3.04
Switzerland	3.79	1.74	1.15	5.75	3.19	2.82
UK	3.89	3.01	2.74	6.85	5.98	5.80
US	4.00	2.95	2.48	8.22	8.47	8.14

Source: The BvD and Author's calculations.

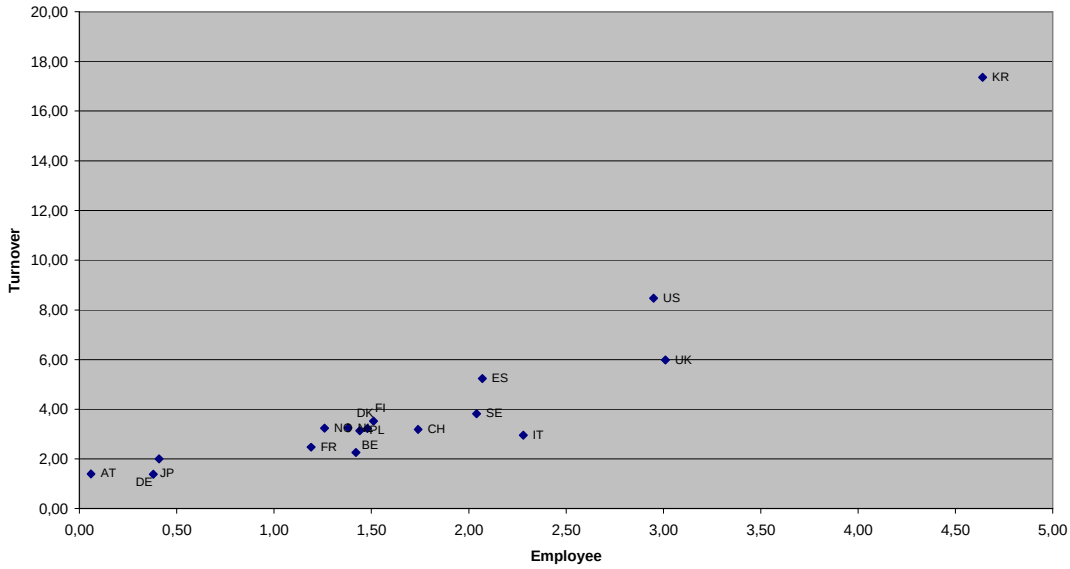
On the other end of the scale are Austria, Japan, and Germany. These three countries are performing badly on both measures and in all available years. Italy is performing really well on the employment indicator, but poorly on the turnover indicator. Italian experts suggest that the employment figures are erroneous for Italy in this sample and that this is a well-known problem.[18]

A strong correlation (Pearsons r equals 0.89) exists between the share of employment and turnover shares of high growth (Figure 3). The Spearmans rank correlation (0.83) is

[18] The experts are from Institute for Economic Research on Firms and Growth in Milan (http://www.ceris.cnr.it)

slightly lower mainly due to the change in the rank of Italy; however, Norway and Netherlands also change positions. Norway and the Netherlands perform poorly in terms of growth in the number of employees as compared to turnover growth.

Figure 3: Correlation between the Share of High-growth Firms Measured by Turnover and Employment, 2000



Which indicator to use can be difficult to ascertain. Turnover is a very clean indicator compared to employment because the latter is influenced by differences in labour market institutions and, to some extent, registration requirements. Moreover, vertical integration can change employment but not turnover. Turnover is mainly influenced by the deflator applied.[19] But in a policy perspective, entrepreneurship and employment creation are very interesting and for that reason the employee indicator should be included in further studies.

One of the objectives of this paper is to inform the debate about entrepreneurship policy so an indicator for young firms is also constructed. A young firm is born within the last 5 years from t.

[19] However, there are problems due to the deflation by an aggregate cpi, which should be at the least industry specific. The authors are working on resolving this problem. Note that the authors are comparing growth rates and for that reason do not need PPP, corrected price indices, which are necessary to compared levels.

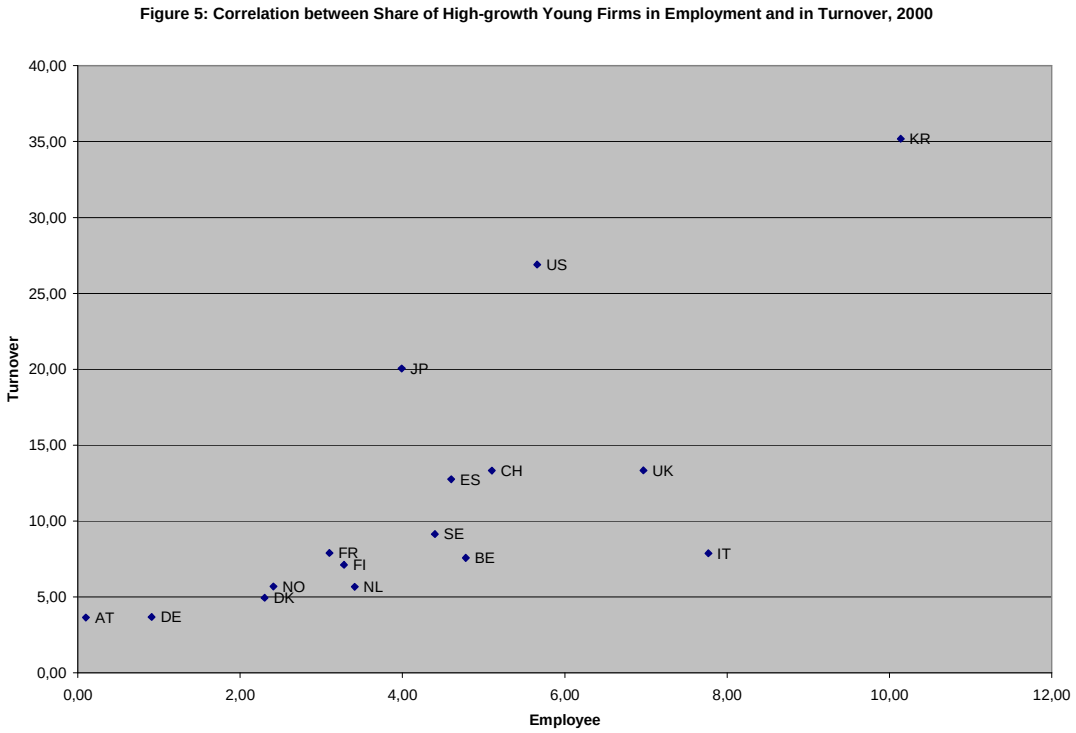
Figure 4 Percent of young high-growth firm

	Employment			Turnover		
	1999	2000	2001	1999	2000	2001
Austria	0.42	0.10	0.95	5.83	3.64	2.85
Belgium	7.33	4.78	2.46	9.69	7.57	6.85
Denmark	3.46	2.30	2.53	7.69	4.94	5.87
Finland	5.13	3.28	3.36	12.98	7.12	7.80
France	4.82	3.10	2.74	9.43	7.89	6.78
Germany	1.34	0.91	1.02	4.06	3.67	3.33
Italy	6.66	7.77	6.65	9.59	7.87	7.25
Japan	1.92	3.99	5.59	14.72	20.05	21.78
Korea	17.14	10.14	11.90	43.23	35.18	34.63
Netherlands	2.65	3.41	1.92	6.76	5.67	3.13
Norway	2.21	2.41	1.56	7.22	5.69	5.47
Portugal	.	.	.	20.93	9.09	2.70
Spain	5.44	4.60	4.51	14.01	12.75	12.17
Sweden	6.20	4.40	3.68	10.65	9.14	7.17
Switzerland	11.36	5.10	4.11	18.42	13.33	10.00
UK	9.30	6.97	6.8	14.23	13.34	13.06
US	15.68	5.66	5.38	37.20	26.90	30.34

Source: The BvD and Author's calculations

The best performers are Korea, the US, and UK. Japan has moved to a third position in turnover, which is questionable in the light of the poor performance for all firms. In the other end of the spectrum are Austria, Germany, Denmark and Norway. The relationship between employee and turnover in 2000 for young firms is highly correlated (Figure 5) although less than for all firms. However, the data for some of the countries is problematic. Portugal suffers from a very small sample size. As before, Italy has high growth in employment and low growth in turnover. The contrary is the case for Japan with regard to young firms, which perform very well in turnover but poorly with employment. The correlation across turnover and employment indicators is 0.73 and Spearman's rank correlation is 0.83.

Figure 5: Correlation between Share of High-growth Young Firms in Employment and in Turnover, 2000



The sample size is quite small for some countries if only young firms are included, so the analysis correlated the share of young high-growth firms to the share of high-growth in the full sample. This is done in Figure 6 and 7 for employee rates and turnover, respectively. The Japanese numbers stand out as Japan were among the worst performing countries in the full sample and among the best in the young firms in particular for turnover. In Figure 3, the linear relation is quite strong. (Pearson's correlation equals 0.89). The Spearman's rank correlation is lower (0.86), mainly due to a shift in the position of Japan. The picture is also evident in the case of turnover in Figure 4. The association according to Spearman's rank correlation (0.55) is mainly due to Japan, but the Netherlands, Finland and Denmark also influence the statistics.

Figure 6: Share of high growth firms, Young and all Firms, Employee, 2000

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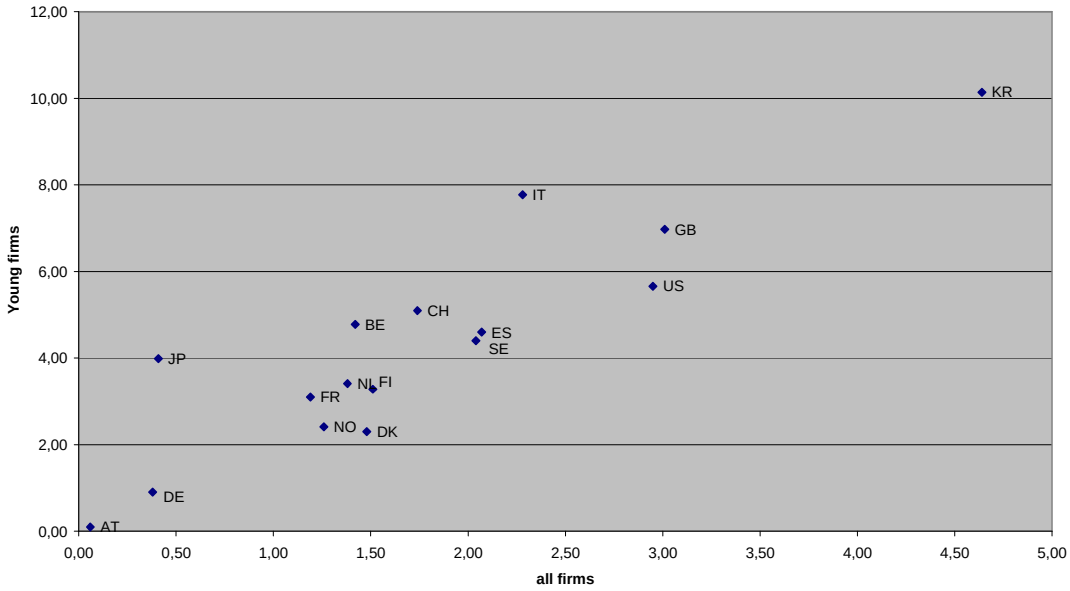

Figure 7: Share of high-growth firms, Young and all Firms, Turnover, 2000

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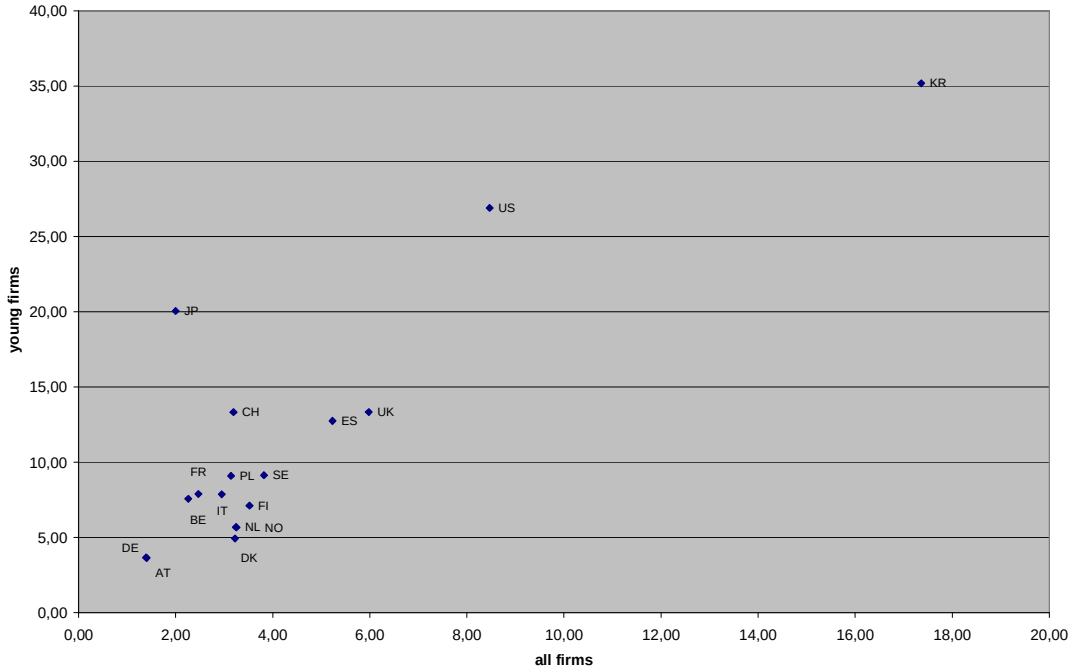


In conclusion, this section has demonstrated that one can create indicators for high-growth firms both for all firms and for young firms. The results can be summarised by looking at the average over the three available time periods for employment and turnover. The aggregated indicator shows that Korea and the US have the highest number of high-growth young firms (entrepreneurs). Austria, Germany and Denmark seem to have the lowest shares for both types of indicators.

The results seem for most countries consistent across the various time periods and definitions although Italy, Japan and Portugal stand out as some of the more problematic countries in the analysis. In order to resolve the problems with Italy and Japan the analysis will carry out more sensitivity analyses.

Comparing these results to that of other studies on high-growth firms in a cross-country context find similar results. Bartelsmans *et al* (2003) provides evidence that the US performs much better than Europe and that performance varies across sectors and time window we return to the latter below. Other indirect evidence can be found in GEM studies (Marraskuu, 2005). Here, the measure is based on expectations to growth among adult population in nascent or new firms and not on empirical evidence. Marraskuu shows that European firms have lower expectations of growth in general than non-European firms.

4. Sensitivity Analysis

The quality of results depends on the quality of the underlying data and their robustness to changes in the applied definitions and assumptions. This section examines the quality of the data, the robustness to changes in assumptions and finally presents multivariate regressions that include control dummies for the variance in industry, size and age structure and business cycles across countries. Furthermore, dummies are included for listed firms and consolidate accounts. These regression analyses isolate the effect of differences in growth patterns across countries by controlling for all other sources for differences.

The overall conclusion of our sensitivity analysis is that the results are robust for alternative definition and that the quality of the data is high enough to support policy conclusions.

4.1 The Quality of the Underlying Data

This section discusses six issues relating to the quality of the data including a discussion of the representativity of the US data. Here the main results are discussed while in Appendix B country effects can be seen from plot B1 to B6 for some of the effects.

Unconsolidated numbers

All the computations in this paper to this point have be based on the balance sheet data disregarding whether they are consolidated or not. Consolidation arises, for example, if a firm has activities in another country. Hence, the balance sheet can be the sum of activities across countries. The database provides access to information on what type of balance sheets are available[20].

Hence, this paper has chosen to compute the indicator for all and for young firms with unconsolidated numbers (i.e. excluding firms with income from for example oversea activities) and consolidated numbers. The result is that the share of high-growth young firms for turnover (number of employees) is 12.77 % (6.64) for consolidated accounts compared to 8.81 % (3.25) for unconsolidated accounts. As the result indicates, it is quite important to control for this factor, in particular if the proportion of firms reporting consolidated accounts varies across countries. Importantly, the US raises concerns as it has firms with mainly consolidated accounts. This can be controlled for by a regression analysis, assuming that the marginal effects of analysing consolidated data versus unconsolidated data are identical across countries. This analysis is undertaken in a companion paper (Gabr, Hoffmann and Junge, 2006).

[20] For very few countries, the consolidation is coded as LF (limited financial statements); according to the BvD, these are mainly unconsolidated numbers.

Mergers, acquirers and vendor

State-of-the-art analysis of firm dynamics controls for mergers and acquirers, which makes growth appear somewhat more organic (within the firm). Through ZEPHYR, a database from the BvD on worldwide deals, the authors can control for some of these deals in the database. By merging the ZEPHYR database into AMADEUS and ORBIS and marked all firms, which were either target or acquiror in a deal. Note the definition of high-growth firm is already organic in the sense that the definition requires a 20 % growth in each year with the 60 % from t to t+2. The share of high-growth firms is then compared for turnover (and number of employees) in ZEPHYR with firms not in ZEPHYR. The result is that the share for young firms in ZEPHYR is 4.25 (0.22) compared to 9.11 (3.48) for young firms not in ZEPHYR. From this it is clear that mergers and acquirers do not have the same dynamics as none mergers and acquirers. We also tried to remove the requirement of 20 % growth each year in which case mergers and acquirors has a higher share of high-growth firms. Therefore, it seems that requiring a 20 % growth rate each year actually removes the mergers and acquirers from the definition used in this paper for high-growth firms.

Listed versus unlisted firms

A small share of the data is listed firms. The authors have compared listed firms to unlisted concentrating on young firms, and the result shows that the share of high-growth firms for turnover (number of employees) is 27.45 (14.9) for listed firms versus 8.81 (3.35) for unlisted firms. These are very large differences, but the share of listed firms is quite small. As the US sample mainly contains listed firms, this result must be analysed with caution.

Censoring

In the course of calculation, this paper has concentrated on continuing firms. Yet suppose that some firms are not included in one country because a threshold criterion needs to be fulfilled in the BvD data, but in another country, which has the same number of firms, there is no such criterion. The nominator will not be influenced by this because only

firms growing more than 60 % are counted. However, since the total number of firms (the denominator) differs between the two hypothetical countries, the indicator will differ.

Another issue arises in case of differences in labour market legislation. Some countries have very strict employment protection. It might be optimal for firms to make a spin-off instead of expanding the same unit, or closing a firm might be the only thing to do instead of firing employees, which could be very expensive. The start-up of a new firm with fewer employees could instead be undertaken. The way that this paper has sampled the data does remove this problem to some extent as the focus is on firms with more than 15 employees. Firms with more than 15 employees are already operating under strict labour market regulation, so there is less need for creating spin-off.

To shed some light on this problem, the number of surviving firms from t to t+2 can be compared to the number of active firms in year t. According to the definition of active employment, the difference is 25 % in Finland compared to 15 % for France and 11 % for Norway. The rest of the countries the difference is less than 10 %. Interestingly, Finland has a threshold value for inclusion in the database, which could be a reason for the large difference in the number of surviving firms. Therefore, these results were checked by comparing them with another definition of active firms based on positive turnover. In this case, the results indicate differences of 3 % in Finland. However, the difference increases to a high of 22 % for both the Netherlands and Portugal. The rest of the countries have less than 13 % difference.

The result from this analysis is inconclusive. The regression analysis could be extended to a censored regression taking into account the difference in exit pattern, but at the moment it is unclear what this would bring to the analysis. In particular, since this paper emphasises the difference between the EU and the rest of the world where systematic difference are not present.

Family owned versus other owner structures.

It is wellknown that family owned firms perform differently than other firms (reference (Bennedsen, Nielsen, Perez-Gonzales and Wolfenzon (2006)). The literature is inconclusive of the effect of family though evidence points in direction of a negative effect on performance from family owned firms. Whether this influences our cross country differences is investigated here.

It is quite difficult to define a family owned firm. In ORBIS firms are divided into owner types. One of these types is individual/family ownership. The main problem is that many firms have more than one owner. Without direct knowledge about the ownership shares or family relations of the owners, any definition of family owned business will be arbitrary. Instead of relying on an arbitrary definition of ownership, we will use the independence indicator of BvD. This classification let firm's management be defined by how independent they are from owners. We use this because in family owned firms owners and management are the same. A firm with many 'small' shareholders (where owner type is ignored) are classified as independent, and management is more likely to be hired from outside. However in firms with one or two large shareholders independence of management is much smaller. Independent firms have more owners on average (i.e. the median of independent firms is 5 with a mean of 9.7 and firms with one large shareholder have median of 1 owner and a mean of 1.6 for Germany[21].

We have computed the proportion of high growth firms for a number of countries depending on management's independence of ownership. We found little or no difference in proportion of high growth firms (i.e. Germany again showed that the proportion of high growth firms in independent firms was 2.94 (4.54) for employees (turnover) and 2.84 (4.65) for firms with one large shareholder and the same result is obtained for other countries).

[21] We did look at the number of owners for other countries as well and found a similar structure.

Representativity of the US Data

The US comes out as a top performer with respect to generating high-growth firms, but the data description reveals that the US sample is small. Moreover, the US includes mainly listed firms with consolidated accounts. A much larger US sample is available for a two year period, 2003-04. For young firms, the result of this larger sample size is quite dramatic. For example, the sample size was 89 in the US for 2001, whereas if the focus is only on two years, this sample size increases to 8858 (100 times). Since the US is so important for the results of this paper, all indicators with growth rates from t to t+1 (2003-04) are computed.

In Table 11, it is evident that the share of high-growth firms has decreased for all countries due to the high 40 % cut-off point for identifying high-growth firms in the short time period. However, the US maintains the lead together with Korea no matter if we look at number of employees or turnover, for all or young firms.

Table 11: Growth Rates with 1 Year Time Horizon

	Share of high-growth firms				Number of observations			
Country	Number of em-ployees, all firms	Turnover, all firms	Number of employees, young firms	Turnover, young firms	Number of employees, all firms	Turnover, all firms	Number of employees, young firms	Turnover, young firms
Austria	0,43	1,24	0,57	3,28	7756	5338	1397	916
Belgium	0,32	0,99	1,13	4,21	15154	9205	1238	736
Denmark	0,27	1,29	0,44	2,59	11328	3806	2488	811
Finland	0,65	1,17	1,30	3,77	6269	6734	846	901
France	0,40	0,87	0,88	3,51	71415	72378	7582	7644
Germany	0,42	0,70	0,73	1,75	90287	80603	14863	12758
Italy	0,90	0,55	1,83	1,33	57175	57166	1202	1202
Japan	0,26	1,02	1,51	9,03	43421	43434	1395	1395
Korea	1,26	4,14	2,34	12,00	7462	7750	1540	1616
Nether-lands	0,75	1,79	0,82	2,96	11674	1510	1094	169
Norway	0,66	1,16	0,54	3,45	10634	10843	2234	2290
Portugal	0,89	0,81	6,45	3,51	337	619	31	57
Spain	0,52	1,47	1,51	5,1	41013	42110	6281	6488
Sweden	0,35	1,06	0,99	3,69	19767	17515	3027	2707
Switzer-land	0,37	0,54	0,99	1,02	1898	1108	202	98
UK	0,55	1,85	1,59	6,67	31494	23520	4966	4034

US	1,33	7,03	2,71	11,45	81463	78554	9194	8858

4.2 Definitions and Assumptions

As no agreed definition of what constitutes a high-growth firm exists, it is necessary to test the robustness of this paper's results to changes in the definition of what constitute a high-growth firm and to changes in the assumptions underlying the definition of high growth. The overall conclusion of this section is that the results are robust to changes in the definitions.

Alternative Definitions

High-growth firms in the crude indicator were firms with a growth rate in employee or turnover over a three years span higher than 60 % and 20 % growth in each year. In this section, the selected indicators are compared with three alternative definitions of high-growth firms.

- The first alternative is based on Birch's work (1987): The relative growth is multiplied in the employment of firms with absolute growth. The indicator weighs large firms more compared to the crude indicator. This indicator is computed with the cut-off point at 20 employees, as recommended by Birch. For example, a firm growing with 100 employees must have a relative growth of at least 20 % to be classified as high growth. The time window is 1999 to 2003 and, therefore, considerably longer than the selected indicator for this paper.
- The second alternative is close to Birch's definition of gazelles (Birch, 1995). A high-growth firm must have a positive turnover (or gross surplus) growth every year and a doubling of turnover in a five year window. Birch used a threshold of $100,000 in turnover, but this analysis imposes a threshold of 15 employees, which is easier to apply in international comparisons, as it avoids problems relating to currency or PPP conversions.
- The third alternative is based on the OECD's work (2002). This definition is based on comparison of the average growth rate across countries at a specific percentile in the distribution of growth rates. The current analysis chooses to

compare the 9. decentile in the turnover and employment distribution of growth rates from t to t+2 across countries with the crude indicator for turnover and number of employees, respectively.

The first and second indicators lead to significant drops in the number of firms in the sample size. For example, Austria goes from 934 to only 159 observations; the drop in observations ranges from 10 % to 80 % depending on the definition. Therefore, these alternative measures of high growth are based on smaller sample than the crude indicator.

In Appendix C Figures C1 to C4 can be examined for country differences in the alternative definitions of high growth firms as compared with our definition. Here we just comment on the main results. All of the definitions of high-growth firms seem to tell similar stories for the leaders and the laggards, whereas a few middle countries move around quite a bit. The US and Korea are always top performers. Austria, Germany, Denmark and Norway are always among the laggard countries. In fact, very little happens occurs when using different definitions. This is further explored by looking at both the Pearson's correlation and Spearman's rank correlation (Table 8).

A strong linear relation exists between the crude indicator[22] and Birch's indicator (also for the young firms). As this sample already controls for size by focusing on firms with 15 to 200 employees, this is no surprise. Note that Japan drops rank a bit and it might be that the size distribution of Japanese firms is skewed towards smaller firms, or that Japanese firms are performing worse because of the extended time horizon. The Pearson's correlation and Spearman's rank correlation are both quite high, which underline that the results of this paper would not have been affected if these alternative definitions were utilised instead of the crude indicator.

[22] Comparison between the crude indicator for young firms and employees in 2000.

Table 8: Correlation of Alternative Indicators with crude Indicator

	Pearson's r	Spearman's rho
Birch	0.69	0.87
Gazelles	0.96	0.92
9. decentile turnover	0.94	0.89
9. decentile employee	0.87	0.86

Source: Author's calculations.

In conclusion, the growth indicator is quite robust to changes in definitions. It is important to note that some of these definitions require more demanding data, and a few countries consequently stand out as very sensitive to the definition of growth.

Alternative Assumptions

This section addresses the stability of the growth indicator to changes in assumptions (*growth rates for high-growth firms* and *time periods*). Finally, there are concerns about the effects of difference in *size, age and industry structure* across countries. The analysis is univariate.[23] Extensions to multivariate methods accounting for all problems are presented in the following section.

The crude indicator is based on an assumption of 60% growth over a three year period and 20% growth in each year. Testing the impact of this assumption is straightforward: simply redo all calculations with 20, 40, 60, 80 and 100 % as thresholds for high growth. For each threshold, the following growth requirements were required for each year: 0, 10, 20, 30, 40, respectively. The correlations between the various indicators based on the different thresholds are very high, both for the full sample and for young firms (Table 9).

Table 9: Sensitivity Analysis, Correlation of Index Across Cutoff Points 20%, 40%, 60%, 80% and 100% (Full Sample)

Employment					
	20	40	60	80	100
20	*				

[23] The results are only reported in the text but all of the background tables are available upon request from the authors.

40	0,95	*			
60	0,76	0,88	*		
80	0,77	0.89	0.97	*	
100	0,66	0,81	0.95	0.98	*
Turnover					
	20	40	60	80	100
20					
40	0,97	*			
60	0,95	0,99	*		
80	0,93	0,98	1,00	*	
100	0,91	0,96	0,99	1,00	*

Source: Author's calculations.

Note: The correlations for young firms are slightly lower and vary between 0.57 and 1. The lowest correlation is found in the employment figures.

The choice of period is also important to consider. In the effort to control for various problems, the time period was extended (to 5 years) when the crude indicator was compared to alternative definitions (see above). The relative stable country rankings over the three available time periods also suggest that the results are stable to changes in the length of the period. A simple test of expanding the time period from 3 to 4 and 5 years also reveal high correlation between the indicators based on the different time periods (Table 10). It is important to note that extending the 20 % growth requirement each year to an additional year makes the 60 % limit obsolete for the 4^{th} and 5^{th} year.

Table 10: Correlation between the Crude Indicators based on Various Time Periods, Young Firms

Employment			
	3 years	4 years	5 years
3 years	*		
4 years	0,92	*	
5 years	0,54	0,69	*
Turnover			
	3 years	4 years	5 years
3 years	*		
4 years	0,99	*	
5 years	0,94	0,95	*

Note: High-growth firms are assumed to have an average growth rate of 20% each year regardless of time period.

The proportion of high-growth firms varies quite a bit by time horizon (not shown here), but as Table 10 makes clear that the 3, 4 or 5 year time horizon has little influence on the crude indicator when it comes to cross-country comparisons. Interestingly, the 5 year indicator is identical to the original definition by Birch, except that this analysis uses firm size instead of 100,000$ as a threshold. Birch found 2.92 % of US firms are high-growth firms and we find 3.2%.

4.3 Industry structure

We also examine the sensitivity to industry structure. As argued many times before sample selection differs across countries and this might induce a bias in industry structure. Since the share of high growth firms varies across industries, we standardize to control for industry. The standard we use is the World (our 17 countries) distribution of firms of one digit alphabetic code. Here we compare the outcome for all firms and employment and turnover, the results are similar for young firms.

Table 11: Share of high growth firms controling for industry structure

	Share of high of high growth firms Employment	Share of high growth firms with control for industry structure	Share of high of high growth firms Turnover	Share of high growth firms with control for industry structure
Austria	0,28	0,35	1,44	1,75
Belgium	1,52	1,56	2,72	2,71
Denmark	1,64	1,54	3,58	3,1
Finland	1,88	1,8	3,92	3,39
France	1,32	1,34	2,66	2,71
Germany	0,46	0,49	1,44	1,53
Italy	3,1	3,38	3,2	3,6
Japan	0,46	1,21	2,21	3,26
Korea	4,95	5,16	17,46	18,63
Netherland	1,18	1,25	3,69	3,59
Norway	1,15	1,19	3,23	3,38
Portugal	2,42	2,95	3,55	5,88
Spain	2,1	2,27	5,39	5,63
Sweden	2,13	1,94	4,08	3,93
Switzerlanc	2,31	1,77	3,89	3,45
UK	3,21	2,96	6,21	5,77
US	3,15	6,61	8,28	16,41

Source: BvD and own calculations

Again US seem to be the only country with large changes in the share of high growth firms. The reason is that US data are mainly listed firms and firms operating in financial intermediation (banks and insurance companies (NACE alphabetic code J)). The world distribution has many firms operating in construction and wholesale and retail sales compared with the US. The the remaining countries small adjustments take place.

5. Conclusion

The objective of this paper is to compute indicators measuring high-growth firms across 17 countries in order to contribute to the policy debate about differences in countries' abilities to generate high-growth firms. The calculations show that countries differ significantly. The US and Korea outperform all other countries, while the European countries lag far behind.

The sensitivity analysis (including multiple regression analyses) showed that these results were very stable for changes in assumptions and various corrections of the data. For example, the results are not sensitive to assumptions and definitions about what constitutes a high-growth firm. Furthermore, the sensitivity analysis revealed that the results were not affected by corrections for mergers and consolidated/unconsolidated accounts, nor did differences in industry structure or firm age across countries seem to play a role for the results.

However, the sensitivity analysis cannot correct for the fact that the representativity of the sample varies substantially across countries. Data for Austria, Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden and the UK covers more than 60% of the existing firms within the 20+ size class and, therefore, there is a high confidence in the results from these countries. Italy, Japan, Korea, the Netherlands, Portugal, Switzerland and the US are based on a much smaller sample sizes and more care should be exercised in the interpretation of these numbers. Tests of representativity of the US data suggest that the results for the US are indeed representative.

Therefore, European countries may be able to learn from the US business environment which appears to be more conducive for high-growth firms.

7. Literature (to be completed)

Appendix A

Table A1a: Growth for continuing firms, small to medium size, employee

	Average growth rates, t to t+2			Share of firms (percent)			Number of observations		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
Austria	0,002	0,008	0,013	0,13	0,06	0,51	1548	6312	6647
Belgium	0,052	0,027	-0,008	2,22	1,42	0,95	13832	14304	14676
Denmark	0,030	0,010	-0,003	2,05	1,48	1,37	10359	10540	10416
Finland	0,057	0,027	0,008	2,87	1,51	1,37	4387	4710	5242
France	-0,018	0,006	-0,008	1,92	1,19	0,98	44640	49287	57011
Germany	0,014	0,001	-0,016	0,55	0,38	0,43	101013	103429	88235
Italy	0,136	0,114	0,043	3,85	2,28	2,03	40506	45102	48296
Japan	-0,044	-0,037	-0,031	0,35	0,41	0,55	17886	42752	47506
Korea	0,244	0,141	0,138	7,18	4,64	4,90	961	5727	6533
Netherlands	-0,096	-0,003	-0,031	1,50	1,38	0,82	5390	5063	7913
Norway	-0,025	-0,032	-0,042	1,34	1,26	0,87	8705	9272	9606
Portugal	0,095	0,044	-0,035	4,71	1,44	1,37	191	209	219
Spain	0,050	0,023	0,007	2,40	2,07	1,90	43007	51631	57833
Sweden	0,060	0,026	0,000	2,86	2,04	1,63	15827	17408	18073
Switzerland	0,094	0,031	0,007	3,79	1,74	1,15	898	804	784
UK	0,057	0,035	0,021	3,89	3,01	2,74	36845	38266	38671
US	0,115	0,093	0,078	4,00	2,95	2,48	8790	8688	8711

Note: Then we compute averages in column 1 to 3, we apply trimmed averages to reduce influence from outliers. 5 pe

Table A1b: Growth for continuing firms small to medium size, turnover

	Average growth rates			Share of firms (percent)			Number of observations		
	1999	2000	2001	1999	2000	2001	1999	2000	20
Austria	0,012	0,013	0,031	2,06	1,40	1,36	1458	5792	77
Belgium	0,067	0,006	-0,013	3,64	2,26	2,26	8664	8792	88
Denmark	0,077	0,030	-0,005	4,60	3,22	3,07	2346	2954	28
Finland	0,117	0,039	0,025	5,26	3,52	3,19	4920	5566	59
France	0,097	0,035	0,006	3,56	2,47	2,09	52732	55991	640
Germany	0,008	-0,011	-0,009	1,72	1,39	1,23	91671	96939	999
Italy	0,091	0,008	-0,020	4,20	2,95	2,43	39696	44578	498
Japan	0,009	-0,026	-0,008	2,17	2,00	2,42	17894	42781	475
Korea	0,516	0,365	0,281	24,38	17,36	16,64	1054	6082	67
Netherlands	0,125	0,025	-0,027	4,96	3,25	2,50	2158	1786	17
Norway	0,034	0,026	-0,007	3,75	3,24	2,77	9288	10153	103
Portugal	0,107	0,000	-0,063	6,36	3,14	1,26	535	542	5
Spain	0,115	0,075	0,057	6,19	5,23	4,93	47335	55570	614
Sweden	0,119	0,046	0,015	5,37	3,82	3,04	15264	17035	182
Switzerland	0,127	0,010	-0,007	5,75	3,19	2,82	730	752	7
UK	0,105	0,059	0,049	6,85	5,98	5,80	27498	27823	278
US	0,172	0,177	0,171	8,22	8,47	8,14	8681	8593	86

Note: Then we compute averages in column 1 to 3, we apply trimmed averages to reduce influence from outliers. 5

Table A2a: Growth among young firms, small to medium size, employee

	Percent growing more than sixty percent			Number of observations		
	1999	2000	2001	1999	2000	2001
Austria	0,42	0,10	0,95	236	1014	1051
Belgium	7,33	4,78	2,46	1296	1380	1383
Denmark	3,46	2,30	2,53	2718	2788	2693
Finland	5,13	3,28	3,36	546	580	715
France	4,82	3,10	2,74	5019	5525	6454
Germany	1,34	0,91	1,02	16022	17022	14237
Italy	6,66	7,77	6,65	1801	1725	1670
Japan	1,92	3,99	5,59	522	1227	1432
Korea	17,14	10,14	11,90	280	1479	1580
Netherlands	2,65	3,41	1,92	529	411	625
Norway	2,21	2,41	1,56	2032	2200	2247
Portugal	.	.	.	.	.	.
Spain	5,44	4,60	4,51	7259	8507	9471
Sweden	6,20	4,40	3,68	2098	2271	2716
Switzerland	11,36	5,10	4,11	88	98	73
UK	9,30	6,97	6,8	5687	6225	6342
US	15,68	5,66	5,38	287	159	93

Source: BvD and own calculations

Table A2b: Growth among young firms small to medium size, turnover

	Percent growing more than sixty percent			Number of observations		
	1999	2000	2001	1999	2000	2001
Austria	5,83	3,64	2,85	223	934	1159
Belgium	9,69	7,57	6,85	784	832	818
Denmark	7,69	4,94	5,87	598	668	681
Finland	12,98	7,12	7,80	647	730	846
France	9,43	7,89	6,78	6097	6438	7517
Germany	4,06	3,67	3,33	14157	15452	15835
Italy	9,59	7,87	7,25	1762	1690	1723
Japan	14,72	20,05	21,78	523	1232	1437
Korea	43,23	35,18	34,63	303	1552	1640
Netherland	6,76	5,67	3,13	296	194	160
Norway	7,22	5,69	5,47	2176	2441	2431
Portugal	20,93	9,09	2,70	43	33	37
Spain	14,01	12,75	12,17	8096	9249	10130
Sweden	10,65	9,14	7,17	1981	2209	2734
Switzerland	18,42	13,33	10,00	76	90	70
UK	14,23	13,34	13,06	4617	5007	5084
US	37,20	26,90	30,34	250	145	89

Source: BvD and own calculations

Appendix B

Figure B1: Unconsolidated data vs. All data, 2000, employee

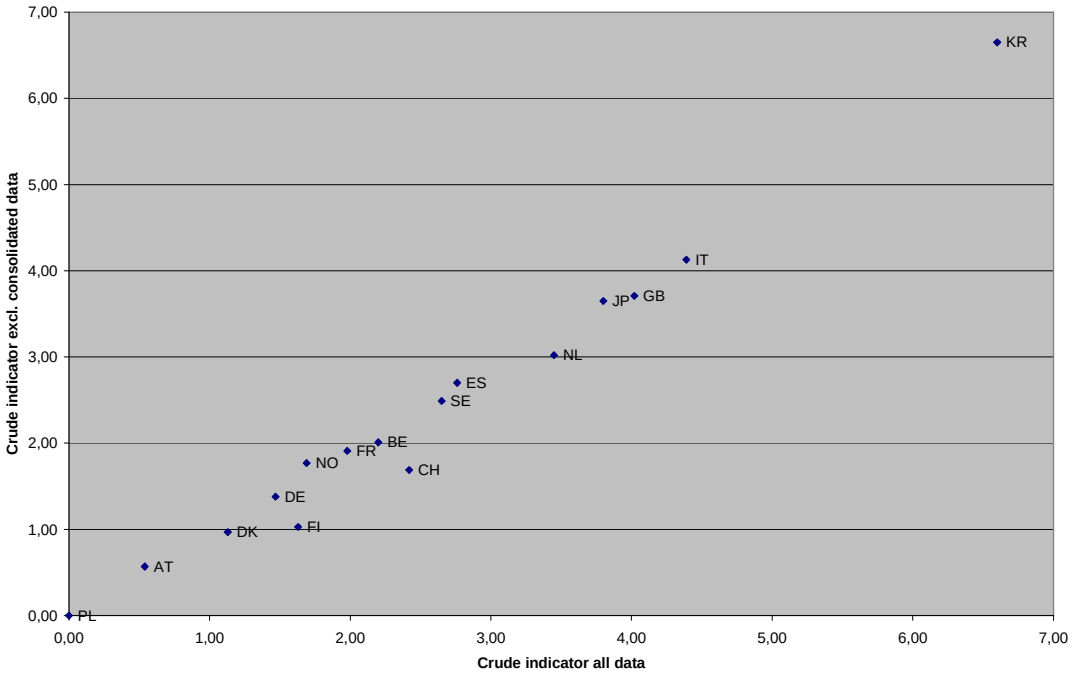


Figure B2: Crude indicator vs. Crude indicator with. Right censoring, 2000, employee

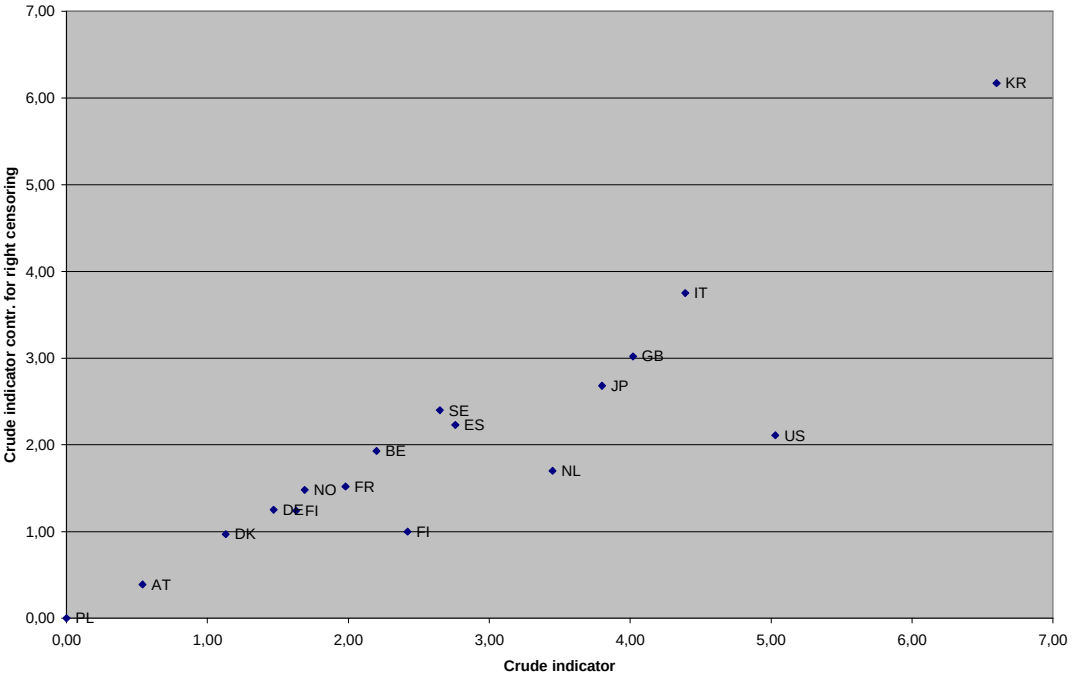


Figure B3: Crude indicator vs. Indicator excl. M&A, 2000, employee

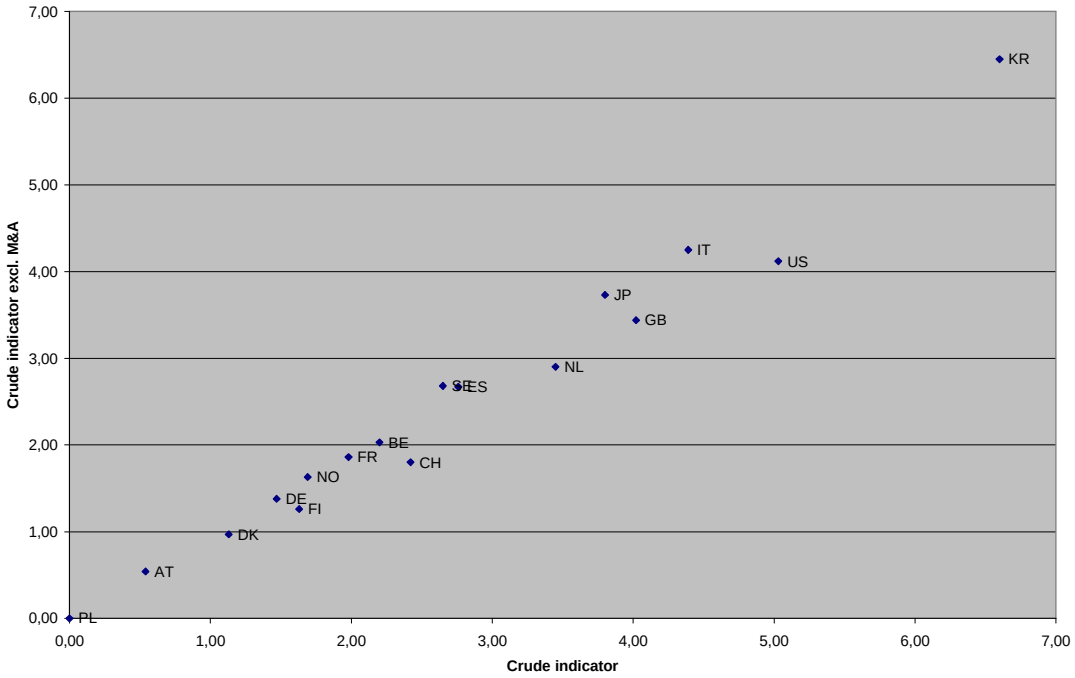


Figure B4: Unconsolidated data vs. All data, 2000, turnover

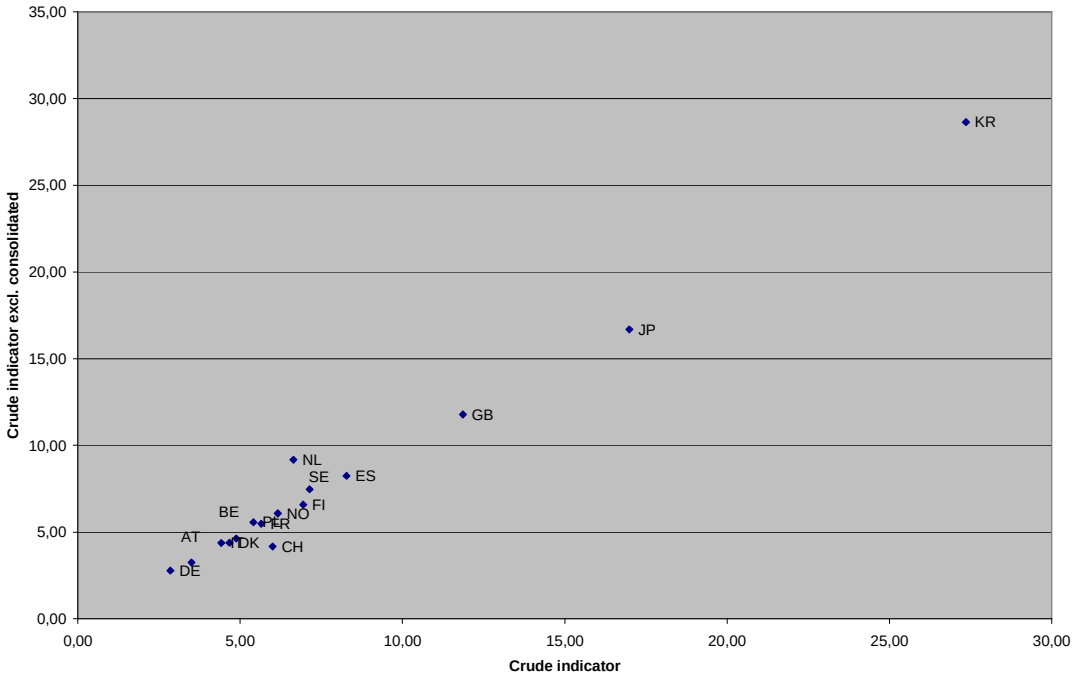


Figure B5: Crude indicator vs. Crude indicator with. Right censoring, 2000, turnover

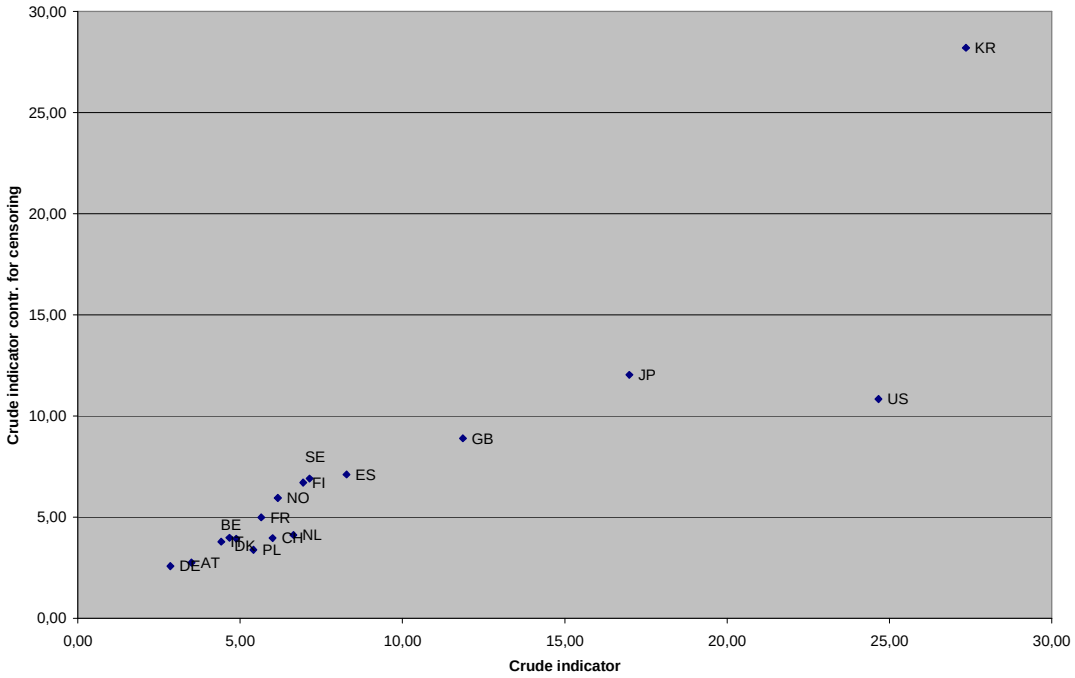
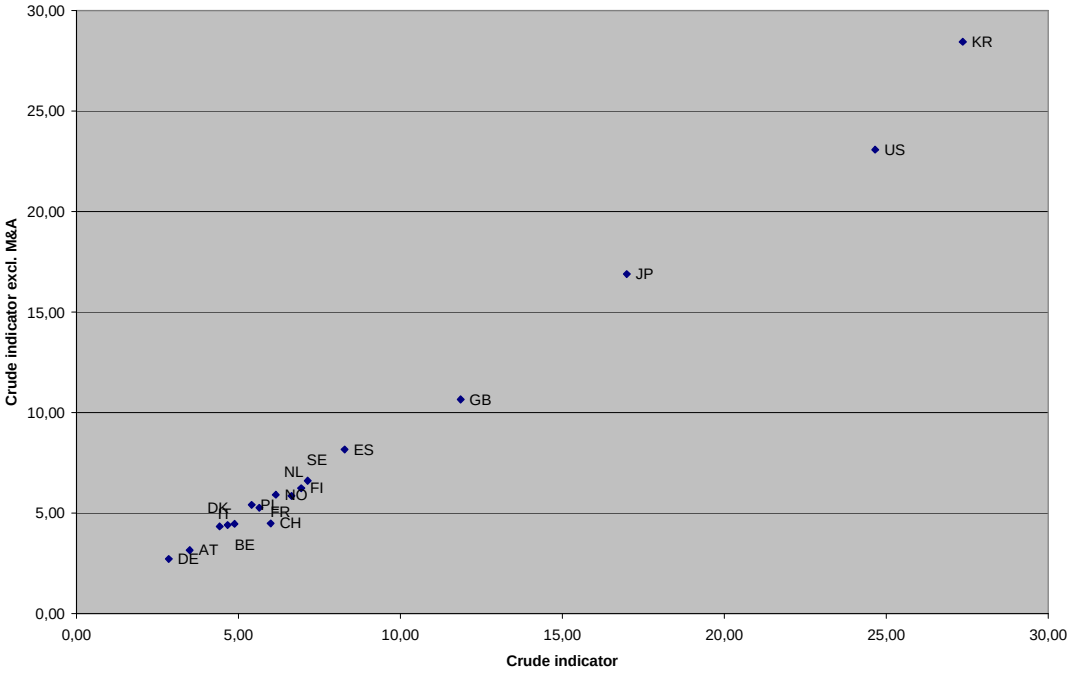


Figure B6: Crude indicator vs. Indicator excl. M&A, 2000, turnover



Appendix C

Figure C1: Crude indicator vs. Birch indicator, 2000, young firms

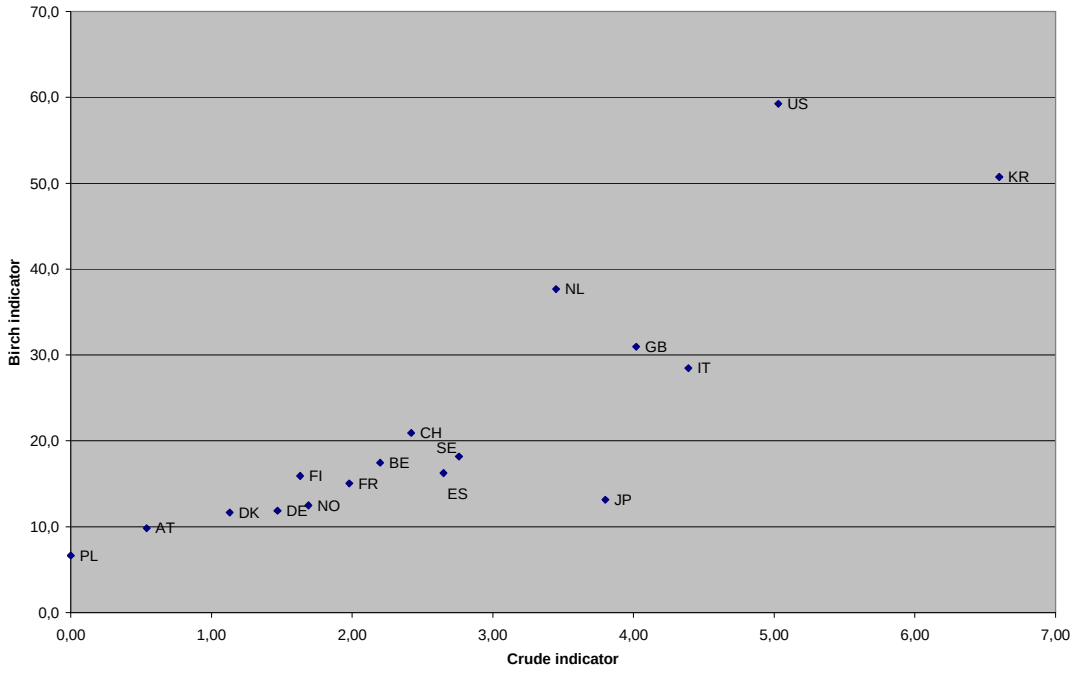


Figure C2: Børsen indicator vs. Crude indicator, 2000, young firms

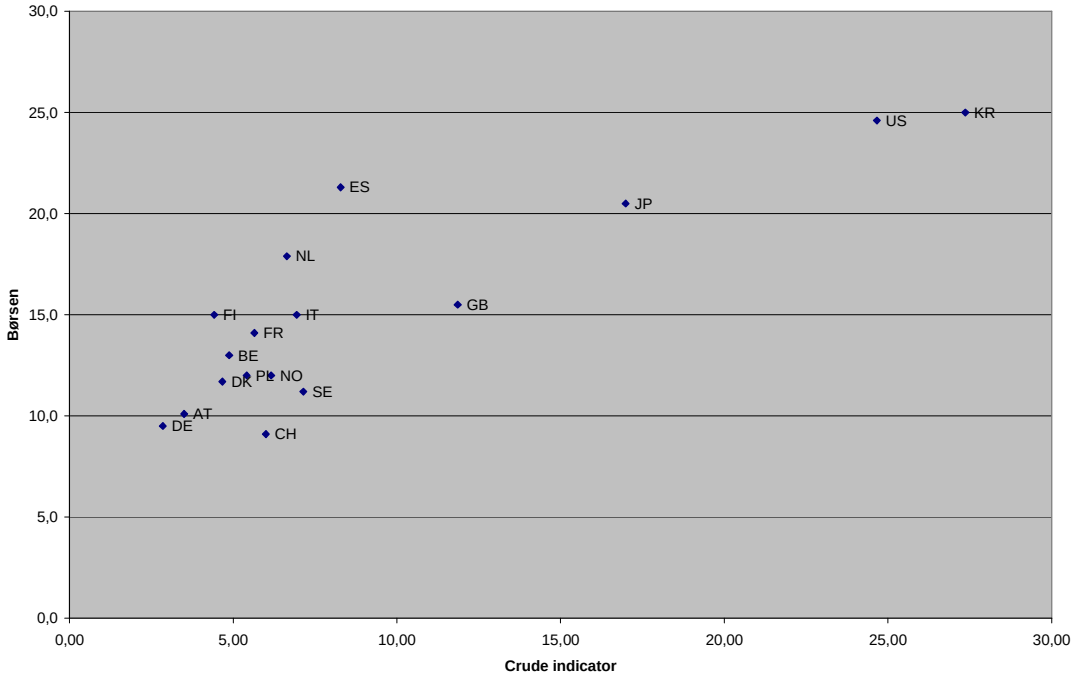


Figure C3: 9. decile vs. Crude indicator, 2000, young firms

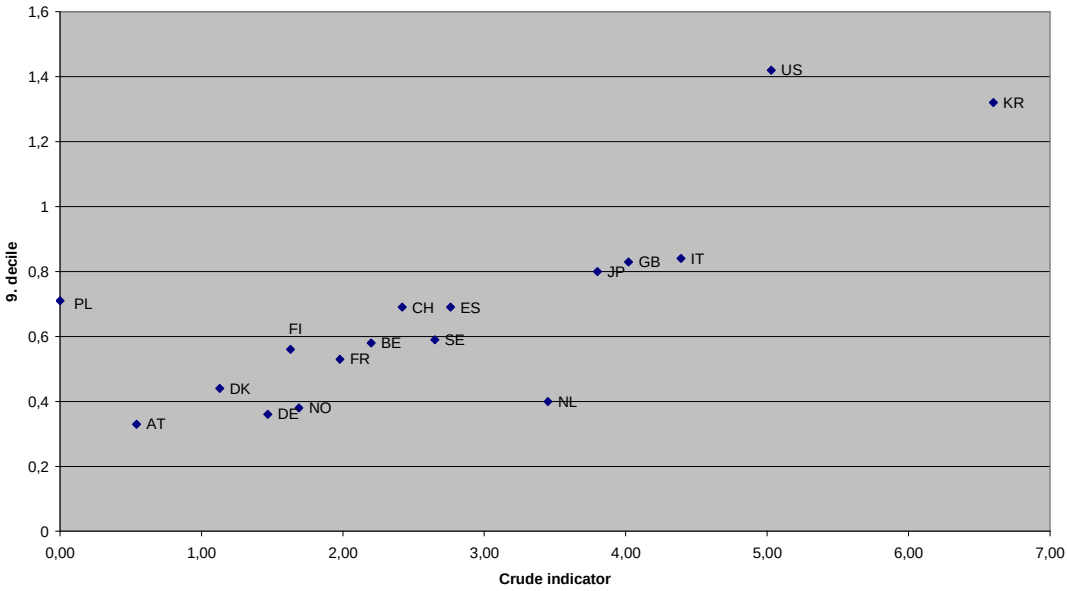


Figure C4: 9. decile vs. Crude indicator, 2000, young firms