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Danish knowledge and business strongholds

An analysis commissioned by the Danish Agency
for Science, Technology and Innovation

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Indhold

1	Danish knowledge and business strongholds	4
2	Basic characteristics	5
3	Productivity	7
4	Research and Development	10
5	Industries	12
6	Method	13
7	Appendix	14
	32	

1 Danish knowledge and business strongholds

This analysis combines the knowledge strongholds mapped in “*Core competences in private sector R&D in Denmark*” with the business strongholds identified by the Danish Ministry of Business and Growth.

In “*Core competences in private sector R&D in Denmark*” 102 research areas were identified in which R&D by Danish firms has an above-average impact on the international research front. These research areas are where Danish companies have a knowledge stronghold. 678 unique companies contributed to a knowledge stronghold and could be linked to a company registration number (i.e. CVR). Out of the 678 companies 504 could be identified in Statistic Denmark’s Firm statistic in 2009. The remaining companies are either established in the period 2009-2012 or have changed CVR number since 2009.

The Ministry of Business and Growth has pointed out 14 industries where Danish industries have a business stronghold. An industry is a stronghold if the productivity in the industry relative to average productivity in Denmark is 20 percent higher than the relative productivity in the same industry among Denmark’s trading partners (comparative advantage)¹. The 14 business strongholds include 20.478 companies (15 pct. of all companies). Note that not all of the 20.478 companies in the 14 industries have a comparative advantage but on average each industry has. In other words business strongholds are defined at industry level whereas knowledge strongholds at company level.

¹ The method of calculating business strongholds is described in “Danmark på de globale markeder”, Økonomiske Tema nr. 5, Økonomi- og Erhvervsministeriet (2007).

Companies with a knowledge stronghold are by definition characterized by being at the forefront of research, development and innovation within a specific scientific area.

The basic idea behind this analysis is that these companies have a potential to exploit their position within the specific scientific areas to establish and develop a Danish business stronghold (comparative advantage). Against this background the main purpose of the analysis is to investigate the relationship between knowledge and business strongholds (focusing on firm level characteristics) and their significance for the Danish economy.

One should be cautious to conclude on the causal relationship between knowledge and business strongholds. Thus, a knowledge stronghold can arise on the basis of a business stronghold and vice versa. It requires more in-depth analysis to conclude on the causal relationship than has been intended with this project. The analysis should be interpreted accordingly.

2 Basic characteristics

Danish companies are divided into four groups according to whether the firm contributes to a knowledge stronghold and whether the firm is located in an industry where Denmark has a business stronghold, see table 1.

TABLE 1

Group	Stronghold		Companies number	Employees number
	Knowledge	Business		
1	Yes	Yes	67	19.654
2	Yes	No	437	112.114
2*	Yes	No	341	105.722
3	No	Yes	20.411	130.470
4	No	No	112.400	1.887.388
All			133.315	2.149.626

* excluding the R&D industry

Only few companies in Denmark both operate within a knowledge and business stronghold. Almost 70 companies are contributing to a knowledge stronghold and at the same time operating in an industry with a business stronghold. This corresponds to 13 pct. of the companies with a knowledge stronghold and accounts for 15 pct. of the employees in companies with a knowledge stronghold.

In comparison there are 437 companies that contribute to a knowledge stronghold, but are not operating within a Danish business stronghold. This corresponds to around 85 pct. of the companies and employees in companies with a knowledge stronghold. These may be companies that have built up a knowledge capacities that have not yet been commercialized and/or knowledge capacities that are not rooted among other companies in the same industries.

A particular challenge for large companies is that they may have activities in more than one industry.

Large companies are often legally organized in a group consisting of several subsidiary companies. In some large companies R&D activities are separated from the headquarter in a subsidiary company (with its own company registration number).

This is important in the context of knowledge and business strongholds since patents and publications often are registered by the headquarter, while the patents and publications are produced in separate R&D subsidiaries. That is, the patents and publications are registered in the industry of the headquarter, but the resources (labor and capital) required to produce the patents and publications are registered in another industry (the R&D-industry).

Since the R&D-industry in Denmark is not a business stronghold large companies can therefore, in principle, be present in both group 1 and 2. One attempt to deal with this is to exclude the R&D-industry from group 2.

Group 2 is then reduced to 341 companies, see table 1. Although a rough estimate, this is a more precise estimate of the number of companies with a knowledge stronghold that have not been transformed into a business stronghold. These companies constitute 68 pct. of all companies contributing to a knowledge stronghold and represent 80 pct. of the employees in these companies. The remaining 96 companies are assumed to be corporations with subsidiaries in the R&D industry.

Companies with a knowledge stronghold are large

The companies with a knowledge stronghold (group 1 and 2) are characterized by having a considerably larger share of medium and large size companies compared to companies without a knowledge stronghold (group 3 and 4).

67 pct. of the companies with both a knowledge and business stronghold (group 1) are medium or large companies. 43 pct. of the companies that hold a knowledge stronghold, but not a business stronghold (group 2) are medium or large companies. Less than one percentage of the companies that do not hold a knowledge stronghold (group 3 and 4) are large companies, see table 2.

the size of a company and the probability of being at the international forefront of research and development. This is reasonable since research at internationally high level is resource intensive.

Companies with knowledge strongholds are important for the Danish economy

Even though the companies which contribute to core competences only represent less than one percent of the companies in Denmark they account for a sizable amount of the activities in the Danish private sector. They account for 6 percent of the employees, 13 percent of the revenue and 25 percent of the export, see figure 1.

TABLE 2: COMPANIES BY SIZE (PCT.)

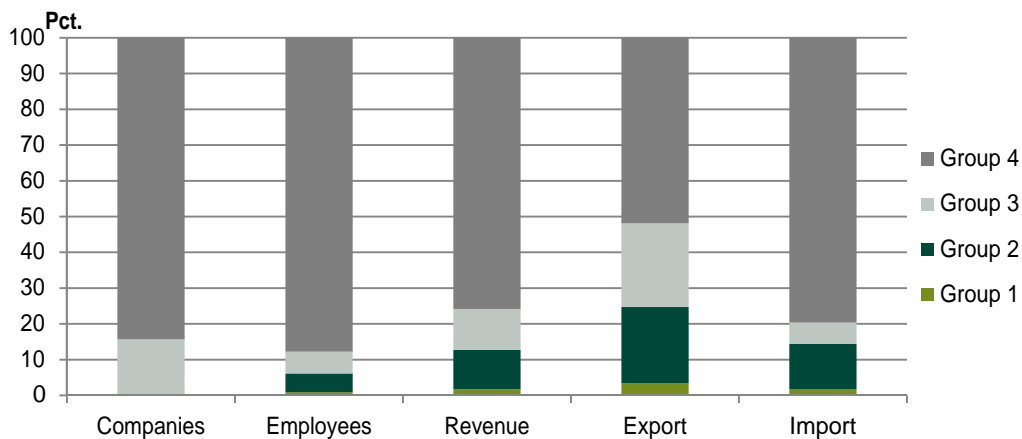
Group	1	2	2*	3	4
Micro (1-9)	9,1	25,2	22,2	89,5	82,0
Small (10-49)	24,2	31,9	29,4	8,8	14,8
Medium (50-249)	33,3	22,7	23,8	1,4	2,6
Large (249+)	33,3	20,2	24,7	0,2	0,5
Total	100,0	100,0	100,0	100,0	100,0

*excluding the R&D industry.

Note: Companies with zero employees are not included.

There seems to be a positive relationship between

FIGURE 1



3 Productivity

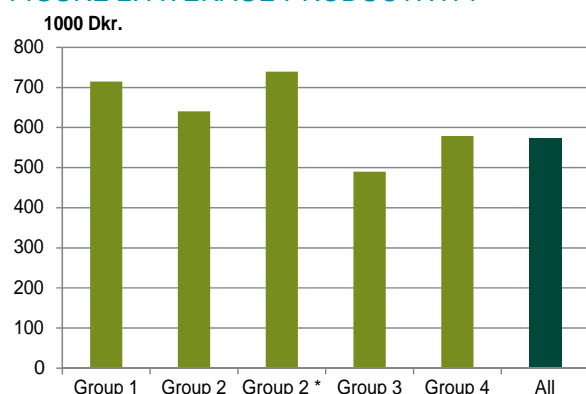
Productivity is crucial for the competitiveness of Danish companies and hence for growth and employment in Denmark.

Value added pr. fulltime employed – the so-called labor productivity – is on average 570.000 in Danish companies. However, there is considerable variation depending on whether the companies can be associated with a knowledge or business stronghold.

The productivity in companies contributing to a knowledge stronghold is almost 30 percent higher than in other companies. Companies which are operating in an industry with a business stronghold are on average not more productive than companies operating in other industries.

The companies which contribute to knowledge strongholds (group 1 and 2*) are characterised by approximately 30 percent higher labour productivity compared to the average productivity level, see figure 2.

FIGURE 2: AVERAGE PRODUCTIVITY



* excluding the R&D industry

The higher productivity in Group 1 and 2 may reflect that these companies have developed a

knowledge stronghold, which give them a competitive advantage. On the other hand it might be that high productive companies can afford the R&D necessary to develop a knowledge stronghold and that the companies were high productive in advance (self-selection).

Group 1 and 3 consist of companies, located in an industry with a Danish business stronghold. It is noteworthy that companies that are linked to a knowledge stronghold (group 1) have a significantly higher productivity than companies which are not linked to a knowledge stronghold (group 3). Especially it is noteworthy that the productivity in Group 3 is lower than the average productivity for all companies as a whole. First and foremost this shows that there is a large spread in the productivity level across companies located in industries with a business stronghold.

Additionally it can indicate that R&D on an international high level can contribute to high efficiency in companies. This hypothesis is supported by the fact that productivity in companies with a knowledge stronghold, but without a business stronghold, is significantly above the overall productivity level for all companies.

Drivers of productivity

Differences in productivity levels between companies may be due to differences in underlying company-specific characteristics. From economic theory it is well known that company size, international orientation, education level and capital intensity are factors that affects productivity, see table 3.

First of all measured at number of employees and size of revenue the companies with a knowledge stronghold (group 1 and 2) are on average more than 10 times larger than companies without (group 3 and 4). Large companies can exploit economies of scale in the production, which usually translates into higher productivity.

Secondly companies with knowledge stronghold exports a large fraction of their products, which make them exposed to international competition. Competition may spur innovation and enhance company efficiency, leading to higher productivity.

Thirdly the employee's education level is higher in companies with a knowledge stronghold. It is well documented that higher educated employees translate into higher company productivity (Den danske produktivitetsudvikling, økonomisk tema 8, Økonomi- og Erhvervsministeriet). A higher education level in the company speeds up the transfer of knowledge internally and externally.

Finally companies with a knowledge stronghold

have higher capital intensity than companies without. When the R&D industry is excluded the companies with a knowledge stronghold but no business stronghold do not have higher capital intensity than the companies with neither a business nor a knowledge stronghold (group 4). The capital stock pr. employee is positively related to labour productivity.

For companies contributing to knowledge strongholds there is almost no differences in productivity between the ones located in an industry with a business stronghold (group 1) and the ones located in an industry without (group 2). When excluding the R&D industry for the reason explained above, Group 2 even have higher productivity than Group 1. This may be explained by the higher education level for the employees in group 2.

Companies contributing to Danish knowledge strongholds (group 1 and 2) are thus characterized by a number of special conditions. They are to a large extent big companies, which are globally

TABLE 3

Average	Group 1	Group 2	Group 2 *	Group 3	Group 4	All
Number of employees	298	277	330	6	17	16
Revenue, million Dkr.	699	728	890	15	21	23
Export, million Dkr.	342	364	458	8	4	6
Import, million Dkr.	104	123	151	1	3	3
Value added, million Dkr.	324	235	283	6	6	7
Labour productivity, 1000 Dkr.	714	640	740	490	579	572
Capital intensity, 1000 Dkr.	1.945	2.967	1.720	579	1.734	1.639
Fraction with higher education	0,36	0,59	0,53	0,22	0,24	0,24
Fraction with a long cycle higher edu.	0,15	0,30	0,25	0,02	0,08	0,07
Number of companies	67	437	341	20.411	112.400	133.315

based, have a large fraction of employees with a higher education and have high capital intensity. The relatively few companies constitute a significant proportion of the Danish economy.

The general picture seems to be that it requires considerable resources to obtain knowledge (publications and patents) on an international high level.

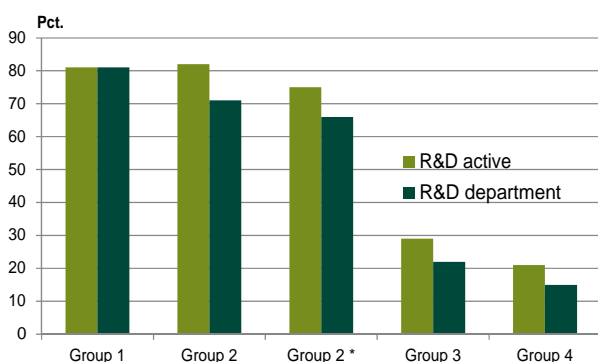
There seems to be a positive relationship between productivity and being a part of the international research frontier. However in order to isolate the effect from contributing to a knowledge stronghold it is necessary to control for the above mentioned conditions which affects productivity.

4 Research and Development

The companies that contribute to knowledge strongholds are not surprisingly more R&D active than other companies.

More than 80 percent of the companies contributing to knowledge strongholds (group 1 and 2) are active in R&D. For companies without a knowledge stronghold (group 3 and 4) it is less than 30 percent, see figure 3. Companies contributing to knowledge strongholds have in a larger extent their own R&D department.

FIGURE 3: R&D ACTIVITIES



* excluding the R&D industry

The same picture emerges when looking at the fraction of employees working with R&D in the companies. More than 10 percent of the employees are working with R&D in companies with a

knowledge stronghold (group 1 and 2). For companies without a knowledge stronghold it is less than 5 percent see table 4.

However it is conspicuous that companies with a knowledge stronghold, but not located in an industry with a business stronghold (group 2) are spending three times as much on R&D pr. employee compared to companies with both knowledge and business stronghold (group 1). This difference is driven by the R&D industry in Group 2. When the R&D industry is excluded (group 2*) the difference disappears, see table 4. The companies with business stronghold do not spend more on R&D pr. Employee than the rest of the companies.

R&D cooperation

The companies with knowledge strongholds are on a large scale cooperating with external actors about R&D. Interestingly the companies which are also located in an industry with a business stronghold (group 1) are cooperating in a larger degree with other firms and actors from abroad. The ones not located in a business stronghold (group 2) are cooperating more with public actors, which especially can be ascribed to the R&D industry's cooperation with the public sector, see table 5.

TABLE 4: R&D

Average	Group 1	Group 2	Group 2 *	Group 3	Group 4	All
Number of employees	431	461	642	132	121	142
Revenue, million Dkr.	1.011	1.187	1.685	541	245	324
Labour productivity, 1000 Dkr.	796	618	786	560	713	698
R&D expenditure pr. employee, 1000 Dkr.	94	312	96	22	34	35
R&D employees pr. employee, fraction	0,11	0,29	0,10	0,03	0,04	0,06
Number of companies	42	229	155	328	3.836	4.435

Footnote: The R&D statistic is based on a representative sample of companies in Denmark and covers 4.435 out of 133.315 companies. For more details see the chapter 6.

TABLE 5: R&D COLLABORATION (FRACTION)

Group	private	public	abroad
1	0,64	0,40	0,62
2	0,55	0,48	0,45
2*	0,50	0,43	0,39
3	0,13	0,06	0,08
4	0,08	0,04	0,04

* excluding the R&D industry

Innovation in companies with a knowledge stronghold.

A larger share of the companies with business and knowledge strongholds (group 1) have product, process, organizational and marked innovation compared to companies with only a knowledge stronghold (group 2), see table 6. Being located in an industry with business stronghold could make the companies more innovative. On the other hand underlying factors can be driving the result. One explanation could be that a larger fraction of companies with a business stronghold has their own R&D department which might explain the larger degree of innovation.

TABLE 6: INNOVATION TYPE (FRACTION)

Group	Innovation type (fraction)				
	innovation total	product	process	organization	marked
1	0,90	0,79	0,50	0,71	0,52
2	0,72	0,55	0,44	0,53	0,41
2*	0,79	0,64	0,50	0,62	0,47
3	0,60	0,33	0,29	0,40	0,33
4	0,51	0,25	0,26	0,35	0,29

* excluding the R&D industry

5 Industries

Tables on industry level can be found in the appendix. The companies in each industry will be divided by whether or not they have a knowledge stronghold. There are too few companies with both knowledge and business strongholds to report on industry level for these companies. The industry attached to each company is based on the newest register data available from 2009. There will be some discrepancies in the number of companies in each industry compared to the analysis “*Core competences in private sector R&D in Denmark*”, which is based on industry categorization from 2011.

Tables:

- Table 1: An overview of the distribution of business strongholds (72-industry level) on industry 36 level.
- Table 2: showing the total of employees, revenue, export, import, value added and capital in each industry on industry 36 level.
- Table 3: showing the education composition and company size in each industry.
- Table 4: showing the mean of employees, revenue, export, import, value added, productivity and capital intensity.
- Table 5: showing the mean of employees composition.

6 Method

This analysis combines the knowledge strongholds mapped in “*Core competences in private sector R&D in Denmark*” with the business strongholds identified by the Danish Ministry of Business and Growth.

The knowledge strongholds are identified as research areas in which R&D by Danish firms has an above-average impact on the international research front over a significant period of time. The strongholds are identified by using patent and publication data.

The business strongholds are identified as industries where the productivity relative to average productivity in Denmark is 20 percent higher than the relative productivity in the same industry among Denmark’s trading partners (comparative advantage).

The strongholds have been linked to every company in Denmark based on the following categorization:

- A company is linked to a knowledge stronghold if it publishes or patents within a technology area, which is identified as a knowledge stronghold.
- A company is linked to a business stronghold if its economic activities take place within an industry, which is identified as a business stronghold.

Data

Knowledge and Business strongholds have been linked by company registration number to a population consisting of all companies in Denmark in 2009 (133.315), see table 7. This is done through research access to register data from Statistic

Denmark. The company registration number is used to combine information from the firm register, education register, accounting register, and R&D register.

The R&D register is based on a survey of around 4000 representative companies each year. Large firm is given a larger weight in the survey. While 3 percent of all firms are covered in the survey more than 50 percent of the companies with a knowledge stronghold are covered because of their size, see table 7.

TABLE 7: NUMBER OF COMPANIES

Group	All	R&D sample	Covered (Pct.)
1	67	42	63
2	437	229	52
2*	341	155	45
3	20.411	328	2
4	112.400	3.836	3
All	133.315	4.435	3

* excluding the R&D industry

Note: The R&D statistics in Denmark is a representative sample of around 4000 companies. The companies in Group 1 and 2 are relative well represented because of their relatively large size.

7 Appendix

Table 1:

Industry (db07 36-level)	Industry (db03 72 level)	Productivity score	Business stronghold	Firms
A Agriculture, forestry and fishing	agriculture	142	Yes	11.295
	fishing	133	Yes	591
	forestry	113	No	425
	food and beverages	108	No	
B Natural resource extraction	other mining and quarrying			100
	extraction of crude petroleum and natural gas and services			24
	mining of coal and lignite; extraction of peat			4
	mining of uranium and thorium ores			
CA Food, drink and tobacco	food and beverages	108	No	1.273
	other mining and quarrying			11
	tobacco			6
CB Textiles and leather	textiles	129,5	Yes	223
	wearing apparel, dressing and dying of fur	87	No	150
	printing and reproduction	112	No	35
	leather, leather and footwear	95	No	16
	manufacturing nec	165	Yes	9
	retail trade, except of motor vehicles and motorcycles; repair of household goods	108	No	
CC Wood, paper and printing	printing and reproduction	112	No	611
	wood and of wood and cork	119	No	380
	pulp, paper and paper	96,5	No	108
	textiles	129,5	Yes	4
	leather, leather and footwear	95	No	
	other manufacturing	165	Yes	
CD Oil refineries, etc.	coke, refined petroleum and nuclear fuel			
	mining of coal and lignite; extraction of peat			
CE Chemicals	chemicals excluding pharmaceuticals	74	No	169
	other manufacturing	165	Yes	4
	food and beverages	108	No	
	coke, refined petroleum and nuclear fuel		No	
CF Pharmaceuticals	coke, refined petroleum and nuclear fuel		No	30
	pharmaceuticals	137	Yes	18
CG Plastics, gas and concrete	other non-metallic mineral	126	Yes	334
	manufacturing nec	165	Yes	239
	rubber and plastics	121	Yes	208
	leather, leather and footwear	95	No	

Industry (db07 36-level)	Industry (db03 72 level)	Productivity score	Business stronghold	Firms
CH Metals	fabricated metal	102	No	1.611
	manufacturing nec	165	Yes	350
	other manufacturing	96	No	114
	basic metals	68	No	93
CI Electronics	scientific instruments	129	Yes	166
	telecommunication equipment	102,5	No	66
	radio and television receivers	114	No	60
	chemicals excluding pharmaceuticals	74	No	37
	other instruments	175	Yes	25
	electronic valves and tubes	73	No	19
	other electrical machinery and apparatus nec	97	No	5
	insulated wire	122	Yes	
	office, accounting and computing machinery	108,5	No	
CJ Manufacturing of electrical equipment	other electrical machinery and apparatus nec	97	No	183
	other manufacturing	96	No	79
	rubber and plastics	121	Yes	33
	other instruments	175	Yes	5
	electronic valves and tubes	122	Yes	
	insulated wire	73	No	
CK Mechanical engineering	other manufacturing	96	No	948
	manufacturing nec	165	Yes	198
	other electrical machinery and apparatus nec	97	No	46
	motor vehicles, trailers and semi-trailers	72	No	
	office, accounting and computing machinery	78	No	
	railroad equipment and transport equipment nec	108,5	No	
	scientific instruments	129	Yes	
CL Transport and transportation equipment	manufacturing nec	165	Yes	95
	motor vehicles, trailers and semi-trailers	78	No	79
	building and repairing of ships and boats	131	Yes	18
	other electrical machinery and apparatus nec	97	No	11
	railroad equipment and transport equipment nec	72	No	11
	other manufacturing	96	No	

Industry (db07 36-level)	Industry (db03 72 level)	Productivity score	Business stronghold	Firms
CM Other manufacturing	other manufacturing	96	No	622
	manufacturing nec	165	Yes	608
	health and social work			275
	building and repairing of ships and boats	131	Yes	111
	wearing apparel, dressing and dyeing of fur	87	No	107
	scientific instruments	129	Yes	15
	aircraft and spacecraft		No	11
	railroad equipment and transport equipment nec	72	No	11
	wood and of wood and cork	119	No	11
	fabricated metal	102	No	9
	radio and television receivers	114	No	6
	other instruments	175	Yes	5
	other electrical machinery and apparatus nec	97	No	4
	computer and related activities	78	No	
	electronic valves and tubes	73	No	
	leather, leather and footwear	102,5	No	
motor vehicles, trailers and semi-trailers	79	No		
pharmaceuticals	95	No		
telecommunication equipment	137	Yes		
D Energy	electricity supply			453
E Water and waste	water supply			192
	sewage and refuse disposal, sanitation and similar activities			173
	recycling	290	Yes	78
	coke, refined petroleum and nuclear fuel			5
F Construction	construction	116	No	11.880
	rubber and plastics	121	Yes	4.253
	other manufacturing	96	No	178
	real estate activities			124
G Wholesale and retail trade	retail trade, except of motor vehicles and motorcycles; repair of household goods	108	No	12.229
	wholesale trade and commission trade, except of motor vehicles and motorcycles	98,5	No	10.620
	sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	92	No	4.853
H Transportation and storage	inland transport	100	No	5.242
	supporting and auxiliary transport activities; activities of travel agencies	112	No	847
	post and telecommunications	68	No	272
	water transport	151	Yes	219
	air transport	59	No	35
	sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	92	No	

Industry (db07 36-level)	Industry (db03 72 level)	Productivity score	Business stronghold	Firms
I Accommodation and food service activities	accommodation and food service activities	98	No	7.101
JA Publishing, TV and radio	computer and related activities	79	No	535
	media activities			448
	printing and reproduction	112	No	102
	other business activities, nec	97,5	No	84
	publishing	77	No	74
	post and telecommunications	68	No	47
JB telecommunications	post and telecommunications	68	No	166
JC IT and information services	computer and related activities	79	No	3.494
	other recreational activities			22
	other business activities, nec	97,5	No	16
	office, accounting and computing machinery	108,5	No	
K Financial and insurance activities	financial intermediation, except insurance and pension funding	97,3	No	1.709
	legal, technical and advertising	97,4	No	1.101
	activities related to financial intermediation	202	Yes	442
	insurance and pension funding, except compulsory social security	110	No	174
L Real estate activities	real estate activities			4.393
MA Consultancy and advisory services	legal, technical and advertising	97,4	No	7.509
	financial intermediation, except insurance and pension funding	97,3	No	24
	other business services			
MB Research and development (R&D)	research and development	83	No	249
MC Other business services	legal, technical and advertising	97,4	No	1.300
	other business activities, nec	97,5	No	1.090
	health and social work			349
N Administrative and support service activities	other business activities, nec	97,5	No	3.521
	renting of machinery and equipment			637
	agriculture	142	Yes	546
	supporting and auxiliary transport activities; activities of travel agencies	112	No	402
	real estate activities			194
	other recreational activities			
	sewage and refuse disposal, sanitation and similar activities			
O Public administration and defence; compulsory social security	public admin and defence; compulsory social security			272
P Education	education			2.474
	legal, technical and advertising	97,4	No	32
	other recreational activities			
	supporting and auxiliary transport activities; activities of travel agencies	112	No	
QA Healthcare	health and social work			6.499

	Industry (db07 36-level)	Industry (db03 72 level)	Productivity score	Business stronghold	Firms
QB	social work activities	health and social work			3.136
		public admin and defence; compulsory social security			
R	Arts, entertainment and recreation	other recreational activities			2.839
		other service activities			127
		public admin and defence; compulsory social security			9
S	Other service activities	activities of membership organizations nec			4.022
		other service activities			3.083
		manufacturing nec	165	Yes	380
		private husholdninger med ansat medhjælp			218
		retail trade, except of motor vehicles and motorcycles; repair of household goods	108	No	96
		other manufacturing	96	No	80
		computer and related activities	79	No	51
		telecommunication equipment	102,5	No	18
		extra-territorial organizations and bodies			9
X	activity not stated	activity not stated			230

The identification of Business strongholds conducted by The Ministry of Business and Growth does not include all industries. Examples of industries not included are natural resource extraction, oil refineries, energy etc.

The Ministry of Business and Growth defines a business stronghold as an industry with a productivity score at 120 and above. A score at 120 and above states that the productivity in the industry relative to average productivity in Denmark is at least 20 percent higher than the relative productivity in the same industry among Denmark's trading partners (comparative advantage).

Table 2

Industry (36) Unit	Knowledge stronghold	Firms Antal	Employees Antal	Revenue mio. kr.	Export mio. kr.	Import mio. kr.	Value added mio. kr.	Capital mio. kr.
A Agriculture, forestry and fishing	Yes	10	1.390	2.532	995	143		
	No	12.304	27.993	63.930	2.265	1.599		
	All	12.314	29.383	66.462	3.260	1.742		
B Natural resource extraction	Yes	5	583	19.061	2.235	1.350	14.513	43.942
	No	124	2.983	12.623	9.696	635	8.878	10.878
	All	129	3.566	31.685	11.932	1.986	23.391	54.819
CA Food, drink and tobacco	Yes	23	18.201	60.085	33.187	5.698	11.440	26.364
	No	1.267	33.724	89.449	30.377	14.473	21.567	38.539
	All	1.290	51.925	149.534	63.564	20.171	33.007	64.904
CB Textiles and leather	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	434	4.800	8.977	4.432	2.810	2.597	3.613
CC Wood, paper and printing	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	1.105	20.524	29.969	6.316	6.828	10.491	14.221
CD Oil refineries, etc.	No	d	d	d	d	d	d	d
	All	d	d	d	d	d	d	d
CE Chemicals	Yes	14	6.670	16.926	15.075	4.656	6.828	34.133
	No	164	4.448	10.337	4.475	3.257	3.037	3.588
	All	178	11.118	27.263	19.551	7.912	9.865	37.720
CF Pharmaceuticals	Yes	16	16.154	44.639	18.418	6.274	20.146	94.323
	No	32	1.208	2.190	974	401	924	5.445
	All	48	17.362	46.830	19.392	6.675	21.071	99.767
CG Plastics, gas and concrete	Yes	18	6.444	14.326	6.234	1.611	5.797	10.956
	No	765	19.889	30.295	9.261	5.740	11.238	15.911
	All	783	26.333	44.621	15.494	7.351	17.035	26.867
CH Metals	Yes	14	2.725	5.076	2.942	914	1.627	1.801
	No	2.154	31.869	43.512	12.423	7.003	16.077	18.022
	All	2.168	34.594	48.588	15.365	7.917	17.704	19.823
CI Electronics	Yes	27	6.781	12.891	10.726	2.437	5.682	35.663
	No	353	9.273	13.057	7.664	2.422	5.323	4.666
	All	380	16.054	25.948	18.389	4.858	11.004	40.329
CJ Manufacturing of electrical equipment	Yes	15	3.562	6.707	4.606	1.998	2.266	3.178
	No	288	6.934	10.685	4.486	2.410	3.713	2.331
	All	303	10.496	17.392	9.092	4.408	5.979	5.509

Industry (36) Unit	Knowledge stronghold	Firms Antal	Employees Antal	Revenue mio. kr.	Export mio. kr.	Import mio. kr.	Value added mio. kr.	Capital mio. kr.
CK Mechanical engineering	Yes	43	22.930	49.346	38.363	12.529	14.815	21.894
	No	1.153	31.538	78.236	50.396	13.608	17.815	18.651
	All	1.196	54.468	127.582	88.759	26.137	32.630	40.545
CL Transport and transportation equipment	Yes	4	496	999	696	349	266	581
	No	212	7.592	11.947	8.653	4.061	2.404	2.945
	All	216	8.088	12.945	9.349	4.411	2.670	3.526
CM Other manufacturing	Yes	8	2.836	9.307	2.700	917	5.066	1.256
	No	1.794	22.873	35.492	16.781	6.665	12.677	11.104
	All	1.802	25.709	44.800	19.481	7.582	17.743	12.360
D Energy	Yes	5	3.041	15.127	2.848	5.178	3.325	0
	No	448	7.167	77.024	8.436	7.887	13.713	0
	All	453	10.208	92.151	11.284	13.065	17.038	0
E Water and waste	Yes	7	756	1.471	0	27	1.244	0
	No	441	7.520	13.179	2.260	346	5.872	1.133
	All	448	8.276	14.651	2.260	373	7.116	1.133
F Construction	Yes	6	1.599	2.975	2	25	1.085	446
	No	16.429	122.595	167.456	2.385	2.452	61.654	33.031
	All	16.435	124.194	170.432	2.387	2.476	62.739	33.477
G Wholesale and retail trade	Yes	60	6.845	30.054	6.782	7.216	5.091	13.253
	No	27.642	297.381	959.423	144.527	208.675	148.402	241.929
	All	27.702	304.226	989.477	151.309	215.890	153.493	255.183
H Transportation and storage	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	6.616	118.761	274.480	145.088	11.305	62.990	233.758
I Accommodation and food service activities	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	7.101	42.379	38.029	482	218	16.469	31.478
JA Publishing, TV and radio	Yes	6	1.601	2.264	22	15	903	871
	No	1.284	25.110	37.265	2.547	1.956	15.114	9.651
	All	1.290	26.711	39.529	2.568	1.971	16.017	10.521
JB Telecommunications	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	166	16.507	46.313	1.687	3.959	21.472	108.390
JC IT and information services	Yes	25	3.818	4.468	331	224	2.715	1.278
	No	3.508	40.578	59.600	9.880	8.480	30.164	20.295
	All	3.533	44.396	64.068	10.211	8.704	32.879	21.573

Industry (36) Unit	Knowledge stronghold	Firms Antal	Employees Antal	Revenue mio. kr.	Export mio. kr.	Import mio. kr.	Value added mio. kr.	Capital mio. kr.
K Financial and insurance activities	Yes	16	859					
	No	3.410	78.878					
	All	3.426	79.737					
L Real estate activities	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	4.393	24.626	32.085	210	263	16.705	261.742
MA Consultancy and advisory services	Yes	57	15.151	27.016	13.842	806	11.371	11.807
	No	7.477	55.965	66.579	4.813	3.267	38.778	65.836
	All	7.534	71.116	93.595	18.655	4.072	50.150	77.643
MB Research and development (R&D)	Yes	96	6.392	12.662	2.227	2.058	5.744	70.398
	No	153	1.981	1.879	500	177	654	14.167
	All	249	8.373	14.541	2.727	2.234	6.398	84.565
MC Other business services	Yes	8	277	269	49	11	150	48
	No	2.731	20.448	28.824	3.010	1.450	10.919	5.207
	All	2.739	20.725	29.093	3.059	1.461	11.069	5.255
N Administrative and support service activities	Yes	4	67	87	6	0	43	17
	No	5.299	67.244	72.042	3.783	1.698	33.367	32.776
	All	5.303	67.311	72.129	3.790	1.698	33.410	32.793
O Public administration and defence; compulsory social security	No	272	637.671					
	All	272	637.671					
P Education	No	2.508	96.822	127	6	2		
	All	2.508	96.822	127	6	2		
QA Healthcare	Yes	4	18	13	1	1		
	No	6.495	19.251	14.842	31	25		
	All	6.499	19.269	14.855	32	26		
QB social work activities	No	3.137	46.099					
	All	3.137	46.099					
R Arts, entertainment and recreation	No	2.975	22.202	17.691	75	157	2.590	
	All	2.975	22.202	17.691	75	157	2.590	
S Other service activities	Yes	d	d	d	d	d	d	d
	No	d	d	d	d	d	d	d
	All	7.957	44.694	10.141	163	216	1.307	684
X activity not stated	No	230	420					
	All	230	420					

Table 3					Education composition					Company size			
Industry (36)	Unit	Knowledge stronghold	firms Number	Employees Number	unskilled Number	skilled Number	kvu Number	mvu Number	lvu Number	micro Number	small Number	medium Number	large Number
A	Agriculture, forestry and fishing	Yes	10	1.390	491	480	176	143	94	d	d	d	d
		No	12.304	27.993	15.164	12.655	6.854	1.152	677	11.950	345	9	d
		All	12.314	29.383	15.655	13.135	7.030	1.295	771	11.951	349	12	d
B	Natural resource extraction	Yes	5	583	29	76	5	26	31	d	d	d	d
		No	124	2.983	886	1.411	220	244	81	88	28	6	d
		All	129	3.566	915	1.487	225	270	112	89	29	7	d
CA	Food, drink and tobacco	Yes	23	18.201	6.625	7.627	1.536	865	877	0	0	7	10
		No	1.267	33.724	17.660	15.061	2.216	1.402	853	811	347	86	23
		All	1.290	51.925	24.285	22.688	3.752	2.267	1.730	813	350	93	33
CB	Textiles and leather	Yes	d	d	d	d	d	d	d	d	d	d	d
		No	d	d	d	d	d	d	d	d	d	d	d
		All	434	4.800	2.098	2.065	427	334	127	330	87	15	d
CC	Wood, paper and printing	Yes	d	d	d	d	d	d	d	d	d	d	d
		No	d	d	d	d	d	d	d	d	d	d	d
		All	1.105	20.524	8.026	11.231	1.021	1.207	356	736	288	70	11
CD	Oil refineries, etc.	No	d	d	d	d	d	d	d	d	d	d	d
		All	d	d	d	d	d	d	d	d	d	d	d
CE	Chemicals	Yes	14	6.670	1.256	2.005	1.210	834	1.441	d	d	d	7
		No	164	4.448	1.475	1.791	563	384	256	85	54	25	d
		All	178	11.118	2.731	3.796	1.773	1.218	1.697	87	54	28	7
CF	Pharmaceuticals	Yes	16	16.154	2.480	3.786	2.893	2.190	4.738	5	d	d	6
		No	32	1.208	267	312	254	121	212	16	8	8	0
		All	48	17.362	2.747	4.098	3.147	2.311	4.950	21	9	11	6
CG	Plastics, gas and concrete	Yes	18	6.444	2.062	2.225	458	690	596	d	4	6	7
		No	765	19.889	8.265	8.500	1.274	1.384	408	435	235	80	15
		All	783	26.333	10.327	10.725	1.732	2.074	1.004	436	239	86	22
CH	Metals	Yes	14	2.725	669	1.378	200	314	125	d	d	4	5
		No	2.154	31.869	11.028	17.283	1.899	1.735	404	1.431	603	111	9
		All	2.168	34.594	11.697	18.661	2.099	2.049	529	1.433	606	115	14
CI	Electronics	Yes	27	6.781	1.873	1.885	582	1.014	1.035	d	7	8	9
		No	353	9.273	2.542	3.310	1.059	1.514	910	208	104	36	5
		All	380	16.054	4.415	5.195	1.641	2.528	1.945	211	111	44	14
CJ	Manufacturing of electrical equipment	Yes	15	3.562	1.006	1.292	315	478	251	d	5	5	d
		No	288	6.934	2.178	2.887	796	738	245	161	90	34	0
		All	303	10.496	3.184	4.179	1.111	1.216	496	162	95	39	7

Industry (36) Unit	Knowledge stronghold	firms Number	Employees Number	Education composition					Company size			
				unskilled Number	skilled Number	kvu Number	mvu Number	lvu Number	micro Number	small Number	medium Number	large Number
CK Mechanical engineering	Ja	43	22.930	5.597	9.593	1.992	3.455	1.734	0	6	19	15
	Nej	1.153	31.538	7.602	16.204	2.673	3.076	938	629	380	132	12
	Alle	1.196	54.468	13.199	25.797	4.665	6.531	2.672	630	386	151	27
CL Transport and transportation equipment	Ja	4	496	151	186	57	55	31	d	d	d	d
	Nej	212	7.592	2.441	4.149	434	494	133	120	66	21	5
	Alle	216	8.088	2.592	4.335	491	549	164	120	68	22	6
CM Other manufacturing	Ja	8	2.836	868	1.142	302	464	344	d	d	d	d
	Nej	1.794	22.873	7.745	12.758	1.541	1.580	632	1.365	353	67	9
	Alle	1.802	25.709	8.613	13.900	1.843	2.044	976	1.368	355	69	10
D Energy	Ja	5	3.041	427	884	208	957	568	d	d	d	d
	Nej	448	7.167	1.280	3.486	834	1.285	779	370	60	12	6
	Alle	453	10.208	1.707	4.370	1.042	2.242	1.347	371	61	12	8
E Water and waste	Ja	7	756	229	289	48	122	68	d	d	d	d
	Nej	441	7.520	3.009	3.102	370	421	189	343	68	25	5
	Alle	448	8.276	3.238	3.391	418	543	257	344	69	28	6
F Construction	Ja	6	1.599	432	791	96	260	59	d	d	d	d
	Nej	16.429	122.595	42.159	78.048	7.766	5.967	1.043	13.679	2.511	215	24
	Alle	16.435	124.194	42.591	78.839	7.862	6.227	1.102	13.680	2.513	216	26
G Wholesale and retail trade	Ja	60	6.845	1.322	2.270	733	1.120	926	10	28	12	8
	Nej	27.642	297.381	162.541	151.145	19.689	17.181	8.272	22.550	4.385	610	97
	Alle	27.702	304.226	163.863	153.415	20.422	18.301	9.198	22.560	4.413	622	105
H Transportation and storage	Ja	d	d	d	d	d	d	d	d	d	d	d
	Nej	d	d	d	d	d	d	d	d	d	d	d
	Alle	6.616	118.761	56.305	45.600	4.720	5.718	2.610	5.308	1.053	205	50
I Accommodation and food service activities	Ja	d	d	d	d	d	d	d	d	d	d	d
	Nej	d	d	d	d	d	d	d	d	d	d	d
	Alle	7.101	42.379	45.197	17.574	2.000	2.619	711	6.294	720	79	8
JA Publishing, TV and radio	Ja	6	1.601	612	307	122	653	278	d	d	d	d
	Nej	1.284	25.110	10.433	6.822	1.967	6.396	3.655	980	217	70	17
	Alle	1.290	26.711	11.045	7.129	2.089	7.049	3.933	983	218	71	18
JB Telecommunications	Ja	d	d	d	d	d	d	d	d	d	d	d
	Nej	d	d	d	d	d	d	d	d	d	d	d
	Alle	166	16.507	5.529	6.358	1.245	1.428	1.664	89	51	19	6
JC IT and information services	Ja	25	3.818	625	1.370	410	577	920	8	9	5	0
	Nej	3.508	40.578	8.625	9.556	4.946	7.160	8.986	2.881	522	85	20
	Alle	3.533	44.396	9.250	10.926	5.356	7.737	9.906	2.889	531	90	21

Industry (36) Unit		Knowledge stronghold	firms Number	Employees Number	Education composition					Company size			
					unskilled Number	skilled Number	kvu Number	mvu Number	lvu Number	micro Number	small Number	medium Number	large Number
K	Financial and insurance activities	Ja	16	859	93	96	44	146	261	7	6	d	d
		Nej	3.410	78.878	16.833	37.559	8.430	9.507	9.995	3.023	222	117	48
		Alle	3.426	79.737	16.926	37.655	8.474	9.653	10.256	3.030	228	118	49
L	Real estate activities	Ja	d	d	d	d	d	d	d	d	d	d	d
		Nej	d	d	d	d	d	d	d	d	d	d	d
		Alle	4.393	24.626	10.574	12.956	2.770	2.409	1.177	3.939	394	53	7
MA	Consultancy and advisory services	Ja	57	15.151	1.888	2.893	1.475	4.268	4.482	18	12	7	14
		Nej	7.477	55.965	12.232	14.966	4.073	13.419	16.331	6.473	869	116	19
		Alle	7.534	71.116	14.120	17.859	5.548	17.687	20.813	6.491	881	123	33
MB	Research and development (R&D)	Ja	96	6.392	798	1.171	814	1.273	2.088	31	35	16	d
		Nej	153	1.981	218	345	229	443	609	118	30	4	d
		Alle	249	8.373	1.016	1.516	1.043	1.716	2.697	149	65	20	4
MC	Other business services	Ja	8	277	39	26	32	49	108	d	d	d	d
		Nej	2.731	20.448	8.533	6.310	2.330	2.838	4.539	2.303	358	65	5
		Alle	2.739	20.725	8.572	6.336	2.362	2.887	4.647	2.305	361	68	5
N	Administrative and support service activities	Ja	4	67	11	10	7	10	16	d	d	d	d
		Nej	5.299	67.244	41.082	28.429	3.962	6.922	2.643	4.268	822	180	29
		Alle	5.303	67.311	41.093	28.439	3.969	6.932	2.659	4.269	825	180	29
O	Public administration and defence; compulsory social security	Nej	272	637.671	192.476	222.414	32.964	245.220	62.048	32	39	63	138
		Alle	272	637.671	192.476	222.414	32.964	245.220	62.048	32	39	63	138
P	Education	Nej	2.508	96.822	24.887	21.950	6.335	29.845	40.435	1.196	972	294	46
		Alle	2.508	96.822	24.887	21.950	6.335	29.845	40.435	1.196	972	294	46
QA	Healthcare	Ja	4	18	7	6	0	23	4	d	d	d	d
		Nej	6.495	19.251	8.631	7.722	1.754	6.972	9.554	6.269	213	10	d
		Alle	6.499	19.269	8.638	7.728	1.755	6.995	9.558	6.271	214	10	d
QB	social work activities	Nej	3.137	46.099	17.442	14.415	1.536	16.636	2.615	1.901	1.082	144	10
		Alle	3.137	46.099	17.442	14.415	1.536	16.636	2.615	1.901	1.082	144	10
R	Arts, entertainment and recreation	Nej	2.975	22.202	17.692	8.374	1.976	4.562	3.166	2.562	349	57	7
		Alle	2.975	22.202	17.692	8.374	1.976	4.562	3.166	2.562	349	57	7
S	Other service activities	Ja	d	d	d	d	d	d	d	d	d	d	d
		Nej	d	d	d	d	d	d	d	d	d	d	d
		Alle	7.957	44.694	22.842	23.824	2.951	8.700	10.132	7.272	573	96	16
X	activity not stated	Nej	230	420	211	177	40	80	68	227	d	d	d
		Alle	230	420	211	177	40	80	68	227	d	d	d

Table 4: Average		Knowledge	firms	employees	revenue	export	import	value added	productivity	capital int.
Unit		stronghold	number	Average	1000.kr, average		1000.kr, average		1000.kr, average	
A	Agriculture, forestry and fishing	Yes	10	139	253.203	99.534	14.309			
		No	12.304	2	5.196	184	130			
		All	12.314	2	5.397	265	141			
B	Natural resource extraction	Yes	5	146	794.269	558.866	337.606	422.663	1.965	6.847
		No	124	24	101.802	78.197	5.124	71.598	3.999	5.714
		All	129	28	123.442	93.218	15.514	82.569	3.935	5.750
CA	Food, drink and tobacco	Yes	23	827	2.730.913	1.508.315	259.021	519.959	678	1.350
		No	1.267	27	70.599	23.976	11.423	17.022	488	645
		All	1.290	40	116.004	49.310	15.649	25.606	491	657
CB	Textiles and leather	Yes	d	d	d	d	d	d	d	d
		No	d	d	18.403	8.211	6.060	5.319	462	424
		All	434	11	20.684	10.211	6.474	5.983	464	432
CC	Wood, paper and printing	Yes	d	d	d	d	d	d	d	d
		No	d	d	26.688	5.332	6.109	9.337	466	541
		All	1.105	19	27.121	5.716	6.179	9.494	465	542
CD	Oil refineries, etc.	No	d	d	d	d	d	d	d	d
		All	d	d	d	d	d	d	d	d
CE	Chemicals	Yes	14	556	1.410.240	1.256.278	387.976	568.969	1.116	3.605
		No	164	27	63.028	27.288	19.857	18.518	643	870
		All	178	63	154.883	111.083	44.956	56.049	675	1.057
CF	Pharmaceuticals	Yes	16	1.077	2.975.955	1.227.877	418.253	1.343.093	1.035	7.395
		No	32	38	68.445	30.426	12.536	28.885	715	4.186
		All	48	369	996.374	412.591	142.020	448.313	817	5.211
CG	Plastics, gas and concrete	Yes	18	358	795.868	346.308	89.511	322.069	680	1.719
		No	765	26	39.602	12.106	7.504	14.690	537	759
		All	783	34	56.987	19.789	9.389	21.756	540	782
CH	Metals	Yes	14	195	362.563	210.155	65.252	116.223	560	447
		No	2.154	15	20.201	5.767	3.251	7.464	503	551
		All	2.168	16	22.411	7.087	3.652	8.166	503	550
CI	Electronics	Yes	27	251	477.429	397.249	90.243	210.432	647	1.946
		No	353	26	36.990	21.710	6.861	15.078	565	341
		All	380	42	68.284	48.393	12.785	28.959	571	455
CJ	Manufacturing of electrical equipment	Yes	15	237	447.144	307.071	133.198	151.048	672	630
		No	288	24	37.102	15.578	8.367	12.892	493	327
		All	303	35	57.401	30.008	14.547	19.732	502	342

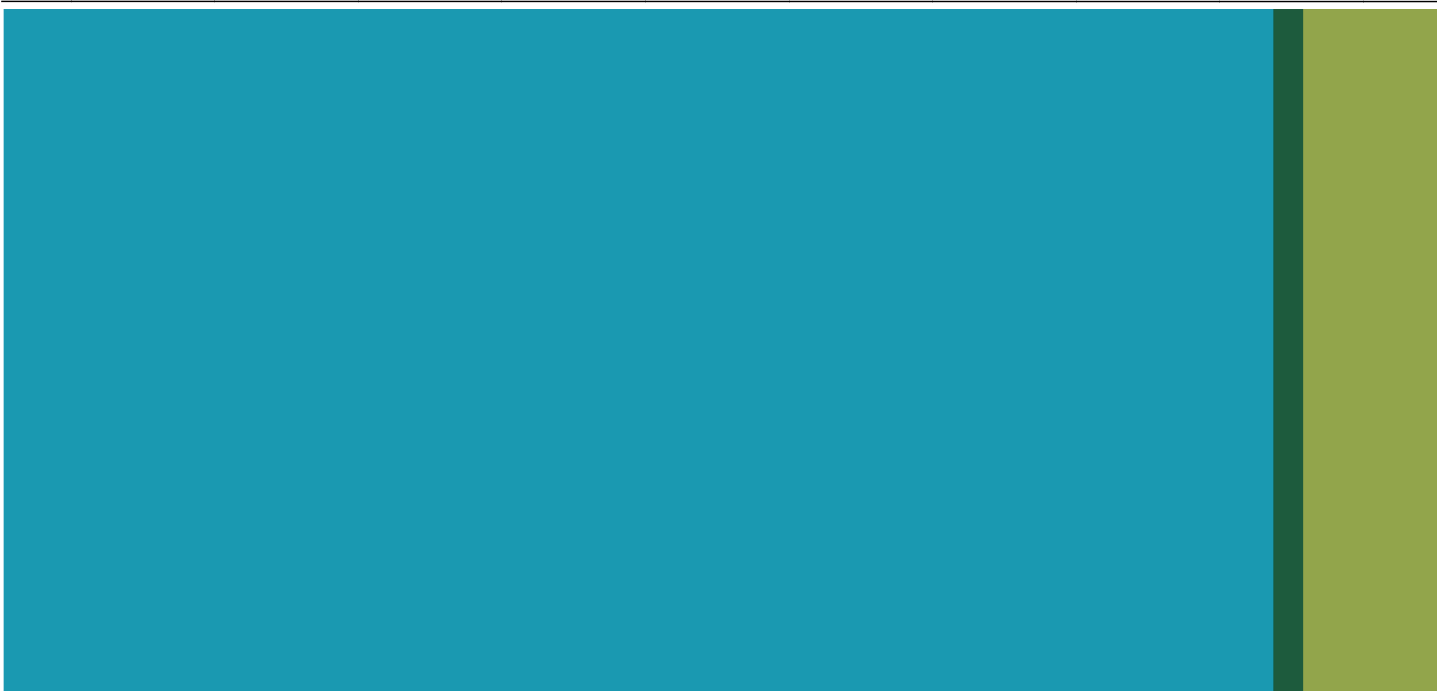
Industry (36) Unit	Knowledge stronghold	firms number	employees Average	revenue 1000.kr, average	export 1000.kr, average	import 1000.kr, average	value added 1000.kr, average	productivity 1000.kr, average	capital int.
CK Mechanical engineering	Yes	43	559	1.202.216	935.687	305.037	361.079	526	556
	No	1.153	27	67.854	43.709	11.802	15.451	530	439
	All	1.196	46	106.806	74.338	21.871	27.320	530	443
CL Transport and transportation equipment	Yes	4	124	249.633	174.016	87.291	66.621	499	874
	No	212	36	56.352	40.817	19.158	11.340	456	395
	All	216	37	59.931	43.284	20.420	12.363	456	404
CM Other manufacturing	Yes	8	355	1.163.431	337.500	114.581	633.269	545	414
	No	1.794	13	19.784	9.354	3.715	7.066	521	491
	All	1.802	14	24.861	10.811	4.208	9.846	522	491
D Energy	Yes	5	760	3.779.472	711.983	1.294.581	830.194	715	
	No	448	16	171.929	18.831	17.605	30.678	2.525	
	All	453	23	203.854	24.965	28.905	37.769	2.509	
E Water and waste	Yes	7	126	244.807	0	4.472	207.046	1.293	
	No	441	17	29.885	5.126	785	13.376	905	1.298
	All	448	19	32.770	5.057	834	15.987	910	1.298
F Construction	Yes	6	267	495.910	344	4.092	180.776	588	126
	No	16.429	7	10.193	145	149	3.753	485	405
	All	16.435	8	10.370	145	151	3.817	485	405
G Wholesale and retail trade	Yes	60	118	518.156	116.937	124.405	87.774	731	1.455
	No	27.642	11	34.709	5.229	7.549	5.369	496	497
	All	27.702	11	35.721	5.462	7.794	5.541	496	499
H Transportation and storage	Yes	d	d	d	d	d	d	d	d
	No	d	d	40.827	21.927	1.708	9.385	569	717
	All	6.616	18	41.487	21.930	1.709	9.531	569	718
I Accommodation and food service activities	Yes	d	d	d	d	d	d	d	d
	No	d	d	5.353	68	31	2.318	400	611
	All	7.101	6	5.355	68	31	2.319	400	611
JA Publishing, TV and radio	Yes	6	267	377.331	3.587	2.453	150.534	905	1.493
	No	1.284	20	29.023	1.983	1.523	11.780	606	518
	All	1.290	21	30.643	1.991	1.528	12.426	608	523
JB Telecommunications	Yes	d	d	d	d	d	d	d	d
	No	d	d	281.621	9.512	24.077	130.464	849	1.966
	All	166	100	280.684	10.224	23.992	130.131	850	1.983
JC IT and information services	Yes	25	166	194.208	14.376	9.739	118.027	737	1.228
	No	3.508	12	16.990	2.817	2.417	8.599	666	373
	All	3.533	13	18.144	2.892	2.465	9.311	666	378

Industry (36) Unit	Knowledge stronghold	firms number	employees Average	revenue 1000.kr, average	export 1000.kr, average	import 1000.kr, average	value added 1000.kr, average	productivity 1000.kr, average	capital int.
K Financial and insurance activities	Yes	16	57						
	No	3.410	23						
	All	3.426	23						
L Real estate activities	Yes	d	d	d	d	d	d	d	d
	No	d	d	7.256	48	60	4.418	1.324	26.188
	All	4.393	6	7.304	48	60	4.450	1.324	26.181
MA Consultancy and advisory services	Yes	57	297	528.068	270.363	15.783	221.841	793	1.472
	No	7.477	7	8.904	644	437	5.186	671	1.056
	All	7.534	9	12.422	2.471	541	6.654	672	1.058
MB Research and development (R&D)	Yes	96	75	148.915	26.194	23.737	67.574	293	7.191
	No	153	13	12.278	3.267	1.156	4.275	482	6.591
	All	249	35	61.077	11.456	9.221	26.881	415	6.805
MC Other business services	Yes	8	35	33.563	6.077	1.392	18.781	591	271
	No	2.731	7	10.555	1.102	531	3.998	529	352
	All	2.739	8	10.622	1.117	534	4.041	530	352
N Administrative and support service activities	Yes	4	17	21.684	1.584	31	10.712	522	164
	No	5.299	13	13.595	714	320	6.297	576	919
	All	5.303	13	13.602	715	320	6.300	576	919
O Public administration and defence; compulsory social security	No	272	2.344						
	All	272	2.344						
P Education	No	2.508	39	3.959	186	52			
	All	2.508	39	3.959	186	52			
QA Healthcare	Yes	4	6	4.145	438	196			
	No	6.495	3	2.303	5	4			
	All	6.499	3	2.304	5	4			
QB social work activities	No	3.137	15						
	All	3.137	15						
R Arts, entertainment and recreation	No	2.975	7	14.336	61	127	12.634	839	
	All	2.975	7	14.336	61	127	12.634	839	
S Other service activities	Yes	d	d	d	d	d	d	d	d
	No	d	d	2.735	44	58	2.091	525	406
	All	7.957	6	2.735	44	58	2.091	525	406
X activity not stated	No	230	2						
	All	230	2						

Table 5 : average		Knowledge	firms	employees	unskilled	skilled	kvu	mvu	lvu
Unit		stronghold	number	average	fraction	fraction	fraction	fraction	fraction
A	Agriculture, forestry and fishing	Yes	10	139	0,37	0,34	0,13	0,07	0,10
		No	12.304	2	0,37	0,34	0,23	0,03	0,02
		All	12.314	2	0,37	0,34	0,23	0,03	0,02
B	Natural resource extraction	Yes	5	117	0,12	0,19	0,01	0,25	0,43
		No	124	24	0,51	0,35	0,05	0,04	0,04
		All	129	28	0,50	0,34	0,05	0,05	0,05
CA	Food, drink and tobacco	Yes	23	791	0,28	0,39	0,10	0,07	0,16
		No	1.267	27	0,52	0,40	0,04	0,03	0,02
		All	1.290	40	0,51	0,40	0,04	0,03	0,02
CB	Textiles and leather	Yes	d	d	d	d	d	d	d
		No	d	d	0,43	0,41	0,07	0,07	0,02
		All	434	11	0,43	0,41	0,07	0,07	0,02
CC	Wood, paper and printing	Yes	d	d	d	d	d	d	d
		No	d	d	d	d	d	d	d
		All	1.105	19	0,33	0,56	0,04	0,06	0,02
CD	Oil refineries, etc.	No	d	d	d	d	d	d	d
		All	d	d	d	d	d	d	d
CE	Chemicals	Yes	14	476	0,24	0,27	0,17	0,12	0,19
		No	164	27	0,36	0,40	0,10	0,08	0,06
		All	178	62	0,35	0,39	0,10	0,09	0,07
CF	Pharmaceuticals	Yes	16	1.010	0,13	0,14	0,21	0,14	0,38
		No	32	38	0,22	0,24	0,22	0,10	0,22
		All	48	362	0,19	0,21	0,22	0,11	0,27
CG	Plastics, gas and concrete	Yes	18	358	0,36	0,39	0,07	0,11	0,06
		No	765	26	0,42	0,44	0,06	0,06	0,02
		All	783	34	0,42	0,44	0,06	0,06	0,02
CH	Metals	Yes	14	195	0,25	0,56	0,06	0,08	0,04
		No	2.154	15	0,31	0,59	0,05	0,05	0,01
		All	2.168	16	0,31	0,59	0,05	0,05	0,01
CI	Electronics	Yes	27	251	0,21	0,30	0,10	0,18	0,21
		No	353	26	0,26	0,38	0,12	0,15	0,09
		All	380	42	0,26	0,37	0,12	0,15	0,10
CJ	Manufacturing of electrical equipment	Yes	15	237	0,26	0,35	0,11	0,15	0,14
		No	288	24	0,29	0,44	0,12	0,11	0,04
		All	303	35	0,29	0,43	0,12	0,12	0,04

Industry (36) Unit	Knowledge stronghold	firms number	employees average	unskilled fraction	skilled fraction	kvu fraction	mvu fraction	lvu fraction
CK Mechanical engineering	Yes	43	533	0,21	0,48	0,11	0,15	0,06
	No	1.153	27	0,22	0,57	0,09	0,10	0,03
	All	1.196	46	0,22	0,56	0,09	0,10	0,03
CL Transport and transportation equipment	Yes	4	124	0,21	0,35	0,13	0,21	0,09
	No	212	36	0,28	0,58	0,07	0,06	0,02
	All	216	37	0,28	0,57	0,07	0,06	0,02
CM Other manufacturing	Yes	8	355	0,25	0,23	0,10	0,15	0,27
	No	1.794	13	0,26	0,58	0,07	0,06	0,02
	All	1.802	14	0,26	0,58	0,07	0,06	0,02
D Energy	Yes	5	608	0,11	0,21	0,10	0,44	0,15
	No	448	16	0,17	0,53	0,11	0,15	0,04
	All	453	23	0,17	0,53	0,11	0,15	0,04
E Water and waste	Yes	7	108	0,28	0,35	0,06	0,15	0,16
	No	441	17	0,34	0,50	0,07	0,07	0,02
	All	448	18	0,34	0,50	0,07	0,07	0,02
F Construction	Yes	6	267	0,21	0,64	0,04	0,09	0,02
	No	16.429	7	0,30	0,60	0,06	0,03	0,00
	All	16.435	8	0,30	0,60	0,06	0,03	0,00
G Wholesale and retail trade	Yes	60	114	0,20	0,26	0,12	0,20	0,21
	No	27.642	11	0,37	0,49	0,06	0,06	0,02
	All	27.702	11	0,37	0,49	0,06	0,06	0,02
H Transportation and storage	Yes	d	d	d	d	d	d	d
	No	d	d	0,52	0,40	0,03	0,03	0,01
	All	6.616	18	0,52	0,40	0,03	0,03	0,01
I Accommodation and food service activities	Yes	d	d	d	d	d	d	d
	No	d	d	0,62	0,29	0,03	0,05	0,01
	All	7.101	6	0,62	0,29	0,03	0,05	0,01
JA Publishing, TV and radio	Yes	6	267	0,14	0,16	0,11	0,22	0,37
	No	1.284	20	0,39	0,24	0,08	0,17	0,13
	All	1.290	21	0,38	0,24	0,08	0,17	0,13
JB Telecommunications	Yes	d	d	d	d	d	d	d
	No	d	d	0,31	0,36	0,13	0,12	0,08
	All	166	99	0,31	0,36	0,13	0,12	0,08
JC IT and information services	Yes	25	153	0,12	0,08	0,09	0,16	0,54
	No	3.508	12	0,26	0,23	0,13	0,18	0,20
	All	3.533	13	0,26	0,23	0,13	0,18	0,20

Industry (36) Unit	Knowledge stronghold	firms number	employees average	unskilled fraction	skilled fraction	kvu fraction	mvu fraction	lvu fraction
K Financial and insurance activities	Yes	16	54	0,10	0,20	0,03	0,23	0,44
	No	3.410	23	0,24	0,37	0,07	0,18	0,14
	All	3.426	23	0,24	0,37	0,07	0,18	0,14
L Real estate activities	Yes	d	d	0,00	0,00	0,00	0,00	0,00
	No	d	d	0,32	0,45	0,10	0,09	0,04
	All	4.393	6	0,32	0,45	0,10	0,09	0,04
MA Consultancy and advisory services	Yes	57	266	0,14	0,14	0,09	0,24	0,40
	No	7.477	7	0,19	0,24	0,07	0,24	0,26
	All	7.534	9	0,19	0,24	0,07	0,24	0,26
MB Research and development (R&D)	Yes	96	67	0,10	0,09	0,14	0,18	0,49
	No	153	13	0,12	0,13	0,11	0,22	0,42
	All	249	34	0,11	0,11	0,12	0,21	0,45
MC Other business services	Yes	8	35	0,12	0,10	0,11	0,26	0,41
	No	2.731	7	0,31	0,29	0,09	0,14	0,18
	All	2.739	8	0,31	0,29	0,09	0,14	0,18
N Administrative and support service activities	Yes	4	17	0,48	0,22	0,11	0,08	0,11
	No	5.299	13	0,44	0,39	0,05	0,08	0,04
	All	5.303	13	0,44	0,39	0,05	0,08	0,04
O Public administration and defence; compulsory social security	No	272	2.344	0,21	0,27	0,04	0,23	0,25
	All	272	2.344	0,21	0,27	0,04	0,23	0,25
P Education	No	2.508	39	0,30	0,22	0,05	0,29	0,14
	All	2.508	39	0,30	0,22	0,05	0,29	0,14
QA Healthcare	Yes	4	5	0,06	0,37	0,01	0,52	0,04
	No	6.495	3	0,23	0,20	0,04	0,17	0,35
	All	6.499	3	0,23	0,20	0,04	0,17	0,35
QB social work activities	No	3.137	15	0,33	0,24	0,03	0,35	0,05
	All	3.137	15	0,33	0,24	0,03	0,35	0,05
R Arts, entertainment and recreation	No	2.975	7	0,47	0,31	0,05	0,11	0,05
	All	2.975	7	0,47	0,31	0,05	0,11	0,05
S Other service activities	Yes	d	d	d	d	d	d	d
	No	d	d	0,34	0,44	0,04	0,10	0,07
	All	7.957	6	0,34	0,44	0,04	0,10	0,07
X activity not stated	No	230	2	0,29	0,32	0,08	0,16	0,15
	All	230	2	0,29	0,32	0,08	0,16	0,15



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