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SMALL COUNTRY MANUFACTURING INDUSTRIES IN TRANSITION - THE CASE OF THE NORDIC REGION

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SMALL COUNTRY MANUFACTURING INDUSTRIES IN TRANSITION - THE CASE OF THE NORDIC REGION

1 INTRODUCTION

The 1980s witnessed a global wave of deregulation. The abolition of capital controls and the substantial improvements in information technologies paved the way for a dramatic increase in foreign direct investment (FDI), which became the prime engine behind the restructuring and internationalization of formerly sheltered markets. The development was further fueled by regionalization and by maturing capital markets facilitating merger and acquisition activities.

Regionalization may have induced investment diverting policies with serious welfare implications, as emphasized by Sweeney (1993). Braunerhjelm and Oxelheim (1992), for instance, show that for the period 1980-91 Swedish direct investments in knowledge-intensive industries were located in the EC instead of in Sweden and argue that to a large extent this was a response to the EC 1992 program. The causality is underpinned by observations reported in Braunerhjelm (1990). The corporate logic behind outlocating investment was the fear of "fortress Europe" with increased protection and discrimination against non-EC companies. This fear has also been emphasized in Yamawiki (1990), Yannopoulous (1990, 1992), Ozawa (1992), Rugman-Verbeke (1991) and by the US International Trade Commission (1992). The typical decision-matrix of a firm located in a non-EC country may look like the example in Table 1. Even a small joint probability of non-membership and "fortress Europe" (p_1) will make expected profits of production at home inferior to those from production located in the EC and lead companies to locate production in the EC, even though it for other EC-membership scenarios would be more profitable to produce at home.

Table 1 Decision-matrix of companies located in non-EC countries
Example

		Becoming a member	Non-member	
			Fortress Europe	Non-fortress Europe
	Probability	$1-p_1-p_2$	p_1	p_2
Decision	Production at home	100	-200	90
	Production in the EC	80	80	80

Note: In this simplified example profits for different combinations of decision and EC membership scenarios are given. Assuming the three outcomes in the table are equally probable, production at home gives an expected loss of 3.3 as compared to a profit of 80 for production inside the EC. Using expected profits as decision criterion, the corporation will produce in the EC, except when p_1 is very small and close to zero.

In this paper we argue that a similar response should apply to other predominantly small "outsiders" as well and to analyze this, the countries in the Nordic area offer an opportunity to make a regional study. Throughout history, the cultural and linguistic similarities of the Nordic countries have resulted in a number of attempts at intra-Nordic agreements and resolutions of

economic co-operation across the borders. Looking back in history, the intra-Nordic borders have changed or been erased making the Nordic area sometimes consist of fewer than the current five nations (of which Iceland will be excluded from this study). In terms of similarities, from the end of the second world war until the end of the 1980s, the Nordic countries were all characterized by extensive use of capital controls. Denmark abolished its capital controls in 1988, Sweden in 1989, Norway in 1990 and finally Finland in 1991. All the Nordic economies may be labeled "public economies" since the total tax burden is very high. In 1992, the Swedish and Danish tax burdens were the highest in the world, with Norway sharing fourth place with the Netherlands.

Institutional differences among the Nordic countries do exist. From a policy point of view, Danish policymaking has been market oriented, while politicians in the other Nordic countries have demonstrated a high propensity to regulate (see Oxelheim, 1993). Moreover, Denmark is a well-established member of the EC, while in 1993, Finland, Norway and Sweden are candidates for membership.

The hypothesis to be discussed in this paper is that knowledge-intensive industries in Finland and Norway should follow the same track as the core of the corresponding Swedish manufacturing industries and outlocate production to the EC. Moreover, the decrease in knowledge intensity in the manufacturing industries that is expected to take place in these countries should have no correspondence in the "insider" country, Denmark.

A signal that underpins our hypothesis is that Finland, Norway and Sweden have all experienced dramatic outflows of direct investments since 1987. In terms of net flows of FDI as a percentage of GDP, among EFTA and OECD countries Sweden shows for 1986-90 the highest gap between outward and inward investment (3.44 percent outward and 0.56 percent inward). Finland also exhibits a large gap (1.96 percent outward and 0.46 percent inward), while Denmark (1.04 percent and 0.54 percent), but also Norway (1.44 percent and 0.90 percent) show a tiny average net outflow of half a percentage point (OECD, 1992). Furthermore, all three "outsiders", in contrast to Denmark, have experienced a decrease in the manufacturing sector as a percentage of GDP. Hence, between 1976 and 1992, the Finnish manufacturing sector shrunk 7.9 percentage points to 18.8 percent, the Norwegian sector went 6.1 percentage points down to 13.4 percent and the Swedish sector decreased 7.0 percentage points to 17.6 percent, while the Danish manufacturing sector increased 1.6 percentage points to 16.5 percent of the total Danish GDP.

Since data on foreign direct investments by Danish, Norwegian and Finnish companies comparable to those used by Braunerhjelm and Oxelheim (1992) are not obtainable (not even registered), we will study here the response as reflected by the decrease in knowledge-intensive activities among the ten largest manufacturing companies of the three Nordic "outsider" countries, and of the one "insider" country. In addition, we will analyze other structural changes that may have been brought about by foreign direct investment activity like the degree of internationalization, concentration in terms of ISIC classification in the top-ten group as well as its relative contribution to the domestic manufacturing part of GDP.

2 DEFINITIONS AND DATA PROBLEMS

The focus of this study is on the largest Nordic manufacturing companies. To be classified as a manufacturing company, more than 50 percent of revenues has to originate from manufacturing. Another criterion is that the company has to be listed on the local stock market.

Iceland is excluded from this study because her stock market has only recently emerged. Hence, this study confines itself to Denmark, Finland, Norway and Sweden. The stock market criterion and its consequences for the outlook of national companies are further discussed in section 4. Each company is classified according to its main economic activity (in terms of revenues) in line with ISIC (International Standard Industrial Classification of all Economic Activities). By focusing on large manufacturing companies, we hope to capture the major macro effects of the industrial sector since large companies account for a high proportion of total output and employment.

We chose to use the value added as the variable because it eliminates sectorial distortions with respect to use of capital, labor or raw-material intensive processes of production. As compared to sales, for instance, it gives a better view of the importance of the sectors for the economy. The ten largest companies of each Nordic country are ranked according to total global value added. Value added is defined as the sum of the operating result (before depreciation), wages, salaries, social costs and other remunerations paid to the employees and to the board of the company. In order to reflect the importance of the top-ten companies relative to domestic value added in manufacturing, the value added variable is transformed into domestic value added as well. Calculations are based on data from annual reports and interviews. The Nordic accounting practice is fairly harmonized and annual reports from different Nordic countries are compatible to each other and to the General Agreed Accounting Principles (GAAP).

In separating the value added from knowledge-intensive companies from value added from other companies, the R&D intensity is used. As reported in Braunerhjelm and Oxelheim (1992), in 1990 the R&D expenses as a percentage of the turnover of Swedish multinational companies was 8.1 and 5.3 for ISIC 35 and 38 respectively, while for other ISIC groups it was considerably smaller; around or below one percent. We here assume that a similar pattern exists also in the other Nordic countries, and classify companies belonging to ISIC 35 and 38 as knowledge-intensive. Large companies are, however, typically multi-product and multi-plant in character which creates classification problems (see Eliasson et al, 1990, and Hirsch and Thomsen, 1993). Thus, the aggregated figures for the knowledge intensity may include some "noise" in terms of small contributions from other ISIC groups. Hence, the figures have to be interpreted as indicative only.

The analysis covers primarily the period 1982-92, but the patterns for 1976-82 as shown in Oxelheim (1984) are sometimes used as a reference. The starting and ending years of the period 1982-92 are similar in major respects: general economic problems and exchange rate turbulence are present in all the Nordic countries under study here.

3 THE LARGEST NORDIC MANUFACTURING COMPANIES - DISTRIBUTIONS OF SIZE AND ACTIVITY

The ten largest manufacturing companies are ranked and listed by total and domestic value added in 1992 in Tables 2-9. Figures for 1982 are also provided in the tables. For various reasons, some of the companies represented in the top-ten groups of 1992 did not qualify for the 1982 top-ten group. When total value added is split into a foreign and a domestic part, the relative number of employees in the country of the parent company serves as a weight. This estimate, however rough, should be adequate to illustrate the importance of the top-ten groups for local GDP. This way of estimating the size of domestic value added seems satisfactory since wages and social costs cover a greater part of total value added.

Real growth in value added during 1982-92 has been calculated as 1) real growth of the 1992 top-ten companies (one set of companies), and 2) real growth of the top-ten groups (two different sets of companies), that is, the total and domestic value added of the 1982 top-ten groups are compared with total and domestic value added of the 1992 groups. The 1982 figures have been deflated with wholesale price indices for that period with the exception of the Swedish figures where producer price indices have been used due to lack of wholesale price index data.

In 1992, the total value added of the top-ten groups in Denmark, Finland, Norway and Sweden as percent of the value added of domestic manufacturing industries were 19, 50, 53 and 57 respectively. The total value added of the Swedish top-ten manufacturing companies stand out as being very large; about six percent larger than the entire Danish manufacturing sector, 64 percent larger than the entire Norwegian manufacturing sector, and 20 percent larger than the entire Finnish manufacturing sector. Value added in domestic operations of the ten largest companies accounted for 11, 28, 30 and 23 percent of manufacturing value added in Denmark, Finland, Norway and Sweden respectively.

3.1 Danish Manufacturing Companies

Total value added of the ten largest Danish manufacturing companies are listed in Table 2. In 1992, their total value added corresponded to 19 percent of the manufacturing part of the Danish GDP. This contribution should be compared to that of the 1982 set of companies, which in 1982 contributed 17 percent. The 1976 figure was 13 percent, as stated in Oxelheim (1984). The top-five group of 1992 accounted for almost 15 percent in 1992 as compared to the 1982 top-five group, which in 1982 contributed 13 percent.

The *domestic* part of value added from the top-ten Danish manufacturing companies accounted for about 11 percent of the manufacturing part of Danish GDP. That is the same share as in 1976, but three percentage points lower than in 1982. The top-five group of 1992 contributed slightly more than eight percent, the same as in 1976, but a decrease of three percentage points since 1982.

As shown in column 6, no company exhibited a negative real growth in total value added. In this respect, Novo, Royal Copenhagen and NKT (Nordiske Kabel & Traadfabriker) exhibited the highest growth rates. Novo, a bio-chemical firm, is ranked first in not only total and domestic value added, but also had the highest real growth in both total and domestic value added. Not so far behind are Royal Copenhagen and NKT. For NKT, a turn-around has taken place; between 1976 and 1982 it exhibited negative real growth in both total and domestic value added.

The pattern for real growth in domestic value added changed over the ten year period under study. Four out of ten companies displayed a negative real growth. Among those, we find Danisco, fourth on the list for real growth rate in total value added, whose relative number of domestic employees was halved between 1982 and 1992. In 1992, all Danish top-ten companies showed higher real growth abroad than at home, reflecting increased internationalization. Between 1982 and 1992, the real growth rate in domestic value added by the 1982 and 1992 top-ten groups was 18 percent as measured by the two sets of top-ten companies, whereas it was 25 percent for the 1992 set of companies. Value added

Table 2 The ten largest Danish manufacturing companies according to value added in 1992

1	2	3		4		5	6		7		8	9
Total value added Rank 1992 (1982)	Group	Value added in MDKK, 1992 Current prices		Value added in MDKK, 1982 Current prices		Value added in Denmark Rank 1992 (Rank 1982 within top group 1992)	Real growth in value added 1982-92 (%)		Value added contribution to the manufacturing part of the Danish GDP (%)		ISIC	Main products
		Total;	in Denmark	Total;	in Denmark		Total;	in Denmark	1992	1982		
1(4)	Novo	5 833	4 236	1 443	1 154	1(4)	238	207	3.0	1.5	35	Bio-chemicals
2(3)	Danisco	4 958	2 299	2 053	1 950	2(3)	102	-1	1.6	2.6	31	Food processing
3(1)	Carlsberg	4 491	2 245	2 828	2 076	3(2)	33	-10	1.6	2.7	31	Food processing
4(2)	FLS Industrier	3 468	1 491	2 831	2 157	4(1)	10	-42	1.1	2.8	38	Machinery
5(7)	NKT	1 965	1 352	602	572	5(8)	173	97	1.0	0.8	38	Electronics
6(5)	Superfos	1 618	883	1 215	1 057	7(5)	11	-30	0.6	1.4	35	Chemicals
7(9)	Jens Villadsen	1 105	278	552	145	10(10)	67	60	0.2	0.2	36	Goods from minerals
8(8)	Aalborg Portland	961	886	581	581	6(7)	38	27	0.6	0.8	36	Goods from minerals
9(-)	Royal Copenhagen	932	814	264	240	9(-)	195	184	0.6	0.3	36	Goods from minerals
10(-)	Bang & Olufssen	911	825	395	343	8(-)	93	101	0.6	0.4	38	Electronics
Total for the 1992 top-ten group		26 242	15 309	12 764	10 275		74.5	24.5	10.9	13.5		
Total for the 1982 top-ten group				13 302	10 819		64.8	18.2		14.2		
The total contribution to Danish GDP from the manufacturing industries in Denmark. (Current prices.)			141 850									
Real growth in total domestic manufacturing value added in Denmark								55.4				

Note: Real growth rates have been deflated with wholesale price indices 1982-1992
The 1982 figures as well as all real growth figures for Royal Copenhagen are estimates.

for the whole Danish manufacturing sector grew in real terms over the same period more than 55 percent, which was by far the highest figure of the four countries involved in the study. Hence, real growth in the domestic value added of the top-ten companies was below, whereas growth in total global value added was above the growth registered for the Danish manufacturing as a whole.

Together, the Danish manufacturing companies which offer products based on chemicals (ISIC 35) accounted domestically for 3.6 percent of Danish manufacturing value added (Novo and Superfos). The second largest product group - food processing (ISIC 31) - contributed 3.2 percent (Danisco and Carlsberg), a decline from 5.3 percent in 1982, when this product group was in the majority. With the clear exception of Novo, the above mentioned companies have exhibited a negative real growth in domestic value added. Machinery, electronics and metal products (ISIC 38) accounted for 2.7 percent of domestic manufacturing value added and experienced a decrease of 2.0 percentage points since 1982, while the three companies representing cement and building materials (ISIC 36) contributed 1.4 percent, an increase of 0.6 percentage points since 1982, when Aalborg Portland was the only ISIC 36 company on the top-ten list.

Table 3 The largest Danish manufacturing companies ranked according to domestic value added in 1992

1 Dom. value added Rank 1992	2 Group	3 Total value added Rank 1992	4 Total value added 1992 MDKK	5 Dom. value added 1992 MDKK	6 Contribution to the manufacturing part of Danish GDP 1992 (%)	7 ISIC	8 Main products
1	Novo	1	5 833	4 236	3.0	35	Bio-chemicals
2	Danisco	2	4 958	2 299	1.6	31	Food processing
3	Carlsberg	3	4 491	2 245	1.6	31	Food processing
4	FLS Industrier	4	3 468	1 491	1.1	38	Machinery
5	NKT	5	1 965	1 352	1.0	38	Electronics
6	Aalborg Portland	8	961	886	0.6	36	Goods from minerals
7	Burmeister & Wain	11	887	885	0.6	38	Ship building
8	Superfos	6	1 618	883	0.6	35	Chemicals
9	Bang & Olufssen	10	911	825	0.6	38	Electronics
10	Royal Copenhagen	9	932	814	0.6	36	Goods from minerals
	Total		26 024	15 916	11.2		

Table 3 shows that a ranking of the Danish compa es according to domestic value added does not change the order of the top-five companies. O one of the top-ten companies disappears: Jens Villadsen, belonging to ISIC 36 leaves th list in favor of Burmeister & Wain, a representative of ISIC 38.

3.2 Finnish Manufacturing Companies

In 1976 the top-ten Finnish manufacturing companies had a *total* global value added correspo ing to 22 percent of the value added in domestic manufacturing industries. In 1982,

Table 4 The ten largest Finnish manufacturing companies according to value added in 1992

1	2	3		4		5	6		7		8	9
Total value added Rank 1992 (1982)	Group	Value added in MFIM, 1992 Current prices		Value added in MFIM, 1982 Current prices		Value added in Finland (Rank 1982 within top group 1992)	Real growth in value added 1982-92 (%)		Value added contribution to the manufacturing part of the Finnish GDP (%)		ISIC	Main products
		Total;	in Finland	Total;	in Finland		Total;	in Finland	1992	1982		
1(3)	Repola	8 557	5 182	1 843	1 788	1(3)	253	120	5.6	3.1	33,34	Wood, pulp and paper
2(1)	Nokia	6 075	3 121	2 703	2 216	4(1)	71	70	3.4	3.9	38	Electronics
3(-)	Outokumpu	5 213	2 494	1 188	1 150	6(-)	234	65	2.7	2.0	38	Metal products
4(4)	Kymmene	4 884	3 658	1 801	1 839	2(4)	106	51	4.0	3.2	33,34	Wood, pulp and paper
5(6)	Kone	3 972	622	1 563	547	10(10)	93	-13	0.7	1.0	38	Machinery
6(-)	Valmet	3 848	2 565	1 294	1 151	5(-)	126	70	2.8	2.0	38	Machinery
7(2)	Enso-Gutzeit	3 843	3 159	2 061	1 855	3(2)	42	30	3.4	3.2	33,34	Wood, pulp and paper
8(5)	Metra	3 744	1 033	1 800	1 620	9(5)	58	-52	1.1	2.8	38	Machinery
9(9,10)	Metsä-Serla	2 930	2 078	1 681	1 614	8(7,9)	33	-2	2.2	2.8	33,34	Wood, pulp and paper
10(-)	Rautaruukki	2 782	2 157	1 162	1 148	7(-)	82	43	2.3	2.0	37	Iron & steel
Total for the 1992 top-ten group		45 849	26 068	17 096	14 928		104.0	32.8	28.2	26.0		
Total for the 1982 top-ten group				15 310	13 005		127.8	52.5		22.7		
The total contribution to Finnish GDP from the manufacturing industries in Finland. (Current prices.)			92 432									
Real growth in total domestic manufacturing value added in Finland								22.8				

Note: Real growth rates have been deflated with wholesale price indices 1982-1992.
Metsä-Serla is the result of a merger between G.A.Serlachius and Metsäliiton Teollisuus.
In 1982, the value added contribution to the manufacturing part of the Finnish GDP for the 1992 top-ten group is higher than the corresponding contribution from the 1982 top-ten group due to the inclusion of Valmet, Outokumpu and Rautaruukki, which were not eligible in 1982.
Nokia has in the period 1982-92 turned from being an ISIC 34 to an ISIC 38 company.

the share was almost 27 percent, and ten years later, it had grown to about 50 percent. The figures for the top-five group of the same years were 14, 18 and 31 percent respectively, revealing that the top-five group was responsible for a major part of the increase.

In 1982, the 1982 top-ten group accounted for 23 percent of the *domestic* value added from Finnish manufacturing companies, an increase of slightly less than three percentage points since 1976. The 1992 top-ten group figure was 28 percent (Table 4, column 7). Looking at the five largest companies ranked according to their domestic contribution, the figures for 1976, 1982 and 1992 were 14, 16 and 19 percent respectively. Four of the top-five 1992 companies were present on the 1982 top-five list. The newcomer, Valmet, was not listed on the stock market until 1988, hence its absence from the 1982 list of companies. The other two newcomers on the top-ten list, Outokumpu and Rautaruukki, were listed on the stock market in 1988 and 1989 respectively.

No 1992 top-ten companies exhibited negative real growth in total value added between 1982 and 1992, whereas, in terms of domestic value added, three companies did. For the 1992 top-ten companies, real growth in total value added was 104 percent, and the domestic figure 33 percent, while Finnish manufacturing value added on the whole showed real growth of only 23 percent. The stronger growth in foreign as compared to domestic parts of Finnish top-ten manufacturing companies reflects increased internationalization. However, as is indicated by the still high growth at home for those companies, they remain important to the domestic part of the Finnish manufacturing industry.

Table 5 The largest Finnish manufacturing companies ranked according to domestic value added in 1992

1 Dom. value added Rank 1992	2 Group	3 Total value added Rank 1992	4 Total value added 1992 MFIM	5 Dom. value added 1992 MFIM	6 Contribution to the manufacturing part of Finnish GDP 1992 (%)	7 ISIC	8 Main products
1	Repola	1	8 557	5 182	5.6	33,34	Wood, pulp and paper
2	Kymmene	4	4 884	3 658	4.0	33,34	Wood, pulp and paper
3	Enso-Gutzeit	7	3 843	3 159	3.4	33,34	Wood, pulp and paper
4	Nokia	2	6 075	3 121	3.4	38	Electronics
5	Valmet	6	3 848	2 565	2.8	38	Machinery
6	Outokumpu	3	5 213	2 494	2.7	38	Metal products
7	Rautaruukki	10	2 782	2 157	2.3	37	Iron & steel
8	Metsä-Serla	9	2 930	2 078	2.2	33,34	Wood, pulp and paper
9	Tampella	12	2 275	1 183	1.3	38	Machinery
10	Metra	8	3 744	1 033	1.1	38	Machinery
	Total		44 151	26 630	28.8		

In 1992, four of the top-ten manufacturing companies' products were based on wood (ISIC 33 and 34): Repola, Kymmene, Enso-Gutzeit and Metsä-Serla. Five companies were built around machinery, metal products and electronics (ISIC 38), compared to only three in 1982. Nokia, for instance, had during the 1980s almost totally converted its production to electronics, which

by 1992 accounted for 75 percent of the company's activities, the rest of the company's activities having to do with machinery. In terms of contribution to domestic total manufacturing value added, 15 percent was accounted for by the former group of companies, and 11 percent by the latter group. One company, Rautaruukki, representing the product category iron & steel (ISIC 37), contributed just over two percent to domestic manufacturing value added. Six of the top-ten companies increased their relative share of the contribution to the domestic part of manufacturing GDP since 1982.

Table 5 shows that a ranking of Finnish top-ten companies according to domestic value added include, with only one exception, the same companies as the list based on total global value added. Kone (ISIC 38) is the company that is replaced in favor of Tampella, also ISIC 38. This ranking yields a top-five, whereby three companies are of ISIC categories 33 and 34, and two (Nokia and Valmet) of ISIC category 38, exhibiting a slight upward change in contribution to domestic value added.

3.3 Norwegian Manufacturing Companies

The ten largest Norwegian manufacturing companies ranked according to *total* value added are exhibited in Table 6. In 1992, total value added from the top-ten companies accounted for about 53 percent of the whole value added of the Norwegian manufacturing industry, an increase of 22 percentage points since 1982 and 35 percentage points since 1976. The contribution of the 1992 and 1982 top-five companies were 43 and 25 percent respectively. In 1976, the top-five of that year contributed 15 percent.

In 1992, the top-ten group contributed about 30 percent to the domestic part of Norwegian manufacturing GDP, an increase of seven percentage points since 1982. The top-five group of 1992 contributed 24 percent in that year, while the 1982 top-five contributed 17 percent in 1982. The 1976 top-five figure was 13 percent.

In terms of real growth in total value added, one company stands out from the rest: Orkla, a food processing company, the biggest in Norway within branded consumer goods. The very high figure of 722 percent is explained by the fact that the company started from a low nominal level in 1982, and expanded at a comparatively high rate over the next ten years. Other companies with high growth in total value added are Freia Marabou, Rieber & Sons, Aker, Dyno and Kværner. Two companies exhibited negative growth in total value added. For the group of 1992 top-ten companies, the real growth rate was 74 percent.

Three companies exhibited negative real growth in domestic value added. Two of those companies displayed negative growth in total value added as well, whereas the third company, Dyno, a company with explosives, plastics and other chemicals-based products as its main products, was to be found among the fastest growing companies in total value added. Kværner, also a fast growing company in total value added, exhibited a near zero real growth rate in domestic value added. In total, the real growth rate of domestic value added of the 1992 top-ten group was 37 percent over the 1982-92 period. The higher real growth in the foreign parts of the top-ten group reflects increasing internationalization. However, they are still engines in the domestic growth process, since real growth in domestic value added from the total Norwegian manufacturing industry was a mere six percent.

As in 1982, the biggest contributor in 1992, totally as well as domestically, had chemicals and petrochemicals as its main products (ISIC 35). Hafslund Nycomed, the newcomer in this

Table 6 The ten largest Norwegian manufacturing companies according to value added in 1992

1	2	3		4		5	6		7		8	9
Total value added Rank 1992 (1982)	Group	Value added in MNOK, 1992 Current prices		Value added in MNOK, 1982 Current prices		Value added in Norway Rank 1992 (Rank 1982 within top group 1992)	Real growth in value added 1982-92 (%)		Value added contribution to the manufacturing part of the Norwegian GDP (%)		ISIC	Main products
		Total;	in Norway	Total;	in Norway		Total;	in Norway	1992	1982		
1(1)	Norsk Hydro	17 327	8 478	7 087	3 756	1(1)	42	31	9.0	7.3	35	Chemicals, petrochemicals
2(2)	Kvaerner	7 565	3 199	1 831	1 794	4(2)	139	3	3.4	3.5	38	Machinery
3(4)	Aker	6 131	4 425	1 161	987	3(5)	206	160	4.7	1.9	38	Machinery
4(10)	Orkla	5 703	4 602	402	358	2(10)	722	644	4.9	0.7	31	Food processing
5(-)	Hafslund Nycomed	3 273	1 509	2 828	2 076	6(-)	-33	-58	1.6	4.0	35	Pharmaceuticals
6(9)	Dyno	2 579	641	563	512	10(8)	165	-28	0.7	1.0	35	Chemicals
7(-)	Freia Marabou	2 263	752	223	149	9(-)	488	192	0.8	0.3	31	Food processing
8(3)	Elkem	1 997	1 498	1 659	1 261	7(3)	-30	-31	1.6	2.5	37	Iron, steel, non-ferrous metals
9(8)	Norske Skogsindustrier	1 925	1 881	635	629	5(7)	76	73	2.0	1.2	33,34	Wood, pulp and paper
10(-)	Rieber & Son	1 232	833	218	208	8(-)	227	132	0.9	0.4	31	Food processing
Total for the 1992 top-ten group		49 995	27 819	16 607	11 730		74.3	37.3	29.6	22.8		
Total for the 1982 top-ten group				15 960	11 517		81.4	39.9		22.4		
The total contribution to Norwegian GDP from the manufacturing industries in Norway. (Current prices.)			94 281									
Real growth in total domestic manufacturing value added in Norway								6.3				

Note: Real growth rates have been deflated with wholesale price indices 1982-1992.
In 1982, the value added contribution to the manufacturing part of the Norwegian GDP for the 1992 top-ten group is higher than the corresponding contribution from the 1982 top-ten group due to the inclusion of Hafslund Nycomed, which was not eligible in 1982.

activity group, has entered the list since 1982. Kværner and Aker, second and third on the total value added list, and fourth and third on the domestic value added list, represented another important product group, namely machinery (ISIC 38). In 1992, this duo's contribution to manufacturing value added was 8.1 percent, a definite increase since 1982. Orkla, the second largest contributor to total domestic manufacturing value added, Rieber & Sons (eighth on the list), and Freia Marabou (ninth on the list) represented food processing (ISIC 31). Since 1982, when Orkla's contribution figure was a mere 0.7 percent (in ISIC 37), the company has been subject to major restructuring and expansion. In 1992, it contributed 4.9 percent of the manufacturing part of Norwegian GDP (in ISIC 31), second only to Norsk Hydro (ISIC 35), which contributed nine percent. Other ISIC groups represented on the top-ten list for 1992 were metals (Elkem) and pulp and paper (Norske Skogsindustrier).

Table 7 The largest Norwegian manufacturing companies ranked according to domestic value added in 1992

1 Dom. value added Rank 1992	2 Group	3 Total value added Rank 1992	4 Total value added 1992 MNOK	5 Dom. value added 1992 MNOK	6 Contribution to the manufacturing part of Norwegian GDP 1992 (%)	7 ISIC	8 Main products
1	Norsk Hydro	1	17 327	8 478	9.0	35	Chemicals, petrochemicals
2	Orkla	4	5 703	4 602	4.9	31	Food processing
3	Aker	3	6 131	4 425	4.7	38	Machinery
4	Kvaerner	2	7 565	3 199	3.4	38	Machinery
5	Norske Skogsindustrier	9	1 925	1 881	2.0	33,34	Wood, pulp and paper
6	Hafslund Nycomed	5	3 273	1 509	1.6	35	Pharmaceuticals
7	Elkem	8	1 997	1 498	1.6	37	Iron, steel, non-ferrous metals
8	Alcatel	11	1 153	1 132	1.2	38	Electronics
9	Kverneland	12	1 108	891	0.9	38	Machinery
10	Rieber & Son	10	1 232	833	0.9	31	Food processing
	Total		47 414	28 448	30.2		

Table 7 shows that a ranking of the Norwegian companies according to domestic value added causes only three companies retain their ranking on the list: Norsk Hydro in first place, Aker in third place and Rieber & Son in tenth place. Two companies are replaced, namely Dyno and Freia Marabou, belonging to ISIC 35 and 31 respectively. In their places come Alcatel (ISIC 38) in eighth place and Kverneland (ISIC 38), in ninth place. This list still means a majority for ISIC 35 in terms of relative value added contribution to the manufacturing part of GDP, closely followed, however, by ISIC 38, which is in the majority in terms of number of companies.

3.4 Swedish Manufacturing Companies

The *total* value added for the 1992 top-ten group of Swedish manufacturing companies is found in Table 8. In 1992, total value added of the top-ten group of companies equaled 57 percent of manufacturing value added in Sweden, almost three percentage points less than for

Table 8 The ten largest Swedish manufacturing companies according to value added in 1992

1	2	3		4		5	6		7		8	9
Total value added Rank 1992 (1982)	Group	Value added in MSEK, 1992 Current prices		Value added in MSEK, 1982 Current prices		Value added in Sweden Rank 1992 (Rank 1982 within top group 1992)	Real growth in value added 1982-92 (%)		Value added contribution to the manufacturing part of the Swedish GDP (%)		ISIC	Main products
		Total;	in Sweden	Total;	in Sweden		Total;	in Sweden	1992	1982		
1(2)	Electrolux	26 417	3 533	12 187	4 485	7(5)	36	-50	1.4	3.5	38	Machinery
2(3)	Ericsson	18 129	7 746	10 751	4 623	4(4)	6	6	3.1	3.6	38	Electronics
3(1)	VOLVO	17 294	11 251	13 653	10 239	1(1)	-20	-31	4.4	7.9	38	Transport equipment
4(-)	Procordia	16 861	10 065	4 081	3 568	2(-)	160	78	4.0	2.8	31	Food processing
5(-)	Stora	15 208	7 166	1 984	1 696	6(-)	383	166	2.8	1.3	33,34	Wood, pulp and paper
6(5)	SKF	11 958	1 760	7 780	1 735	10(10)	-3	-36	0.7	1.3	38	Machinery
7(-)	SCA	11 069	3 385	2 378	1 557	8(-)	193	37	1.3	1.2	33,34	Wood, pulp and paper
8(6)	Saab-Scania	10 753	7 313	6 837	5 606	5(3)	-1	-18	2.9	4.3	38	Transport equipment
9(8)	Sandvik	8 368	3 128	4 312	3 622	3(6)	22	-46	1.2	2.8	37	Iron, steel products
10(-)	Astra	8 316	3 442	1 401	1 296	9(-)	274	67	1.4	1.0	35	Pharmaceuticals
Total for the 1992 top-ten group		144 373	58 789	65 364	38 427		39.1	-3.7	23.2	29.7		
Total for the 1982 top-ten group				76 954	40 989		18.1	-9.7		31.7		
The total contribution to Swedish GDP from the manufacturing industries in Sweden. (Current prices.)			253 000									
Real growth in total domestic manufacturing value added in Sweden								23.2				

Note: Real growth rates have been deflated with producer price indices 1982-1992 within category 3 according to ISIC.

the 1982 top-ten group in 1982. The corresponding 1976 figure was 40 percent. The top-five share for 1992 was 37 percent, an increase by ten percentage points since 1976, but a decrease by five percentage points since 1982.

In 1992, the *domestic* value added contribution to Swedish GDP from the top-ten group of that year was 23 percent. This is an increase by one percentage point from 1976, but a decrease by nine percentage points since 1982. The top-five domestic contributors exhibited a noticeable downward change since 1982 as well - the 1992 top-five figure was 16 percent, as compared to 24 percent in 1982 - and the share in 1992 was back to its 1976 level.

Real growth in total value added between 1982 and 1992 was decisively positive, whereas real growth in domestic value added was not. One company exhibited a strong negative trend in real growth in total value added, namely Volvo, which slid from the number one position in 1982 to third place in 1992. SKF and Saab-Scania exhibited small negative real growth. Stora, which did not make the list in 1982, had the highest real growth in total value added, almost 400 percent, rendering it a place among the top-five. One more company of ISIC 33 and 34 has, thanks to high real growth in total value added (almost 200 percent) since 1982, entered the 1992 top-ten list, namely SCA. Astra, another newcomer among the top-ten companies grew almost 300 percent in total value added over the same period. Procordia, formerly state-owned Statsföretag, had a real growth of over 160 percent since 1982. Due to its not being listed on the stock exchange in 1982, it was not one of the top-ten companies that year. Procordia's two main activities are food processing (42 percent of turnover in 1992), and pharmaceuticals and bio-chemicals (38 percent of the 1992 turnover).

Five of the top-ten companies exhibited negative real growth in domestic value added. One company - Stora - displayed real growth of more than one hundred percent, while the worst performance was exhibited by Electrolux, number one on the total top-ten list. No company showed real growth in domestic value added larger than real growth in total value added (which also goes for Ericsson when decimals are considered), which is a sign of an ongoing, if not accentuated process of internationalization. The top-ten group of 1992 showed a negative real growth in domestic value added of almost four percent since 1982, as compared to a real growth of 23 percent for the whole Swedish manufacturing industry during the same period.

In 1992, the main products represented in the top-ten group were machinery, electronics and metal products (ISIC 38). They accounted for 13 percent of domestic manufacturing value added, of which transport equipment (Volvo and Saab-Scania) contributed seven percent. This was a decline since 1982, when these two companies contributed 12 percent. In 1992, electronics contributed just over three percent (Ericsson). The decline for this product group by six percentage points since 1982 is to a large extent explained by the fact that by our definition Asea was no longer eligible to appear in this study. The third major product category within ISIC 38, namely machinery, added a mere two percent. Chemicals - ISIC 35 - (Astra) and iron and steel - ISIC 37 - (Sandvik) together accounted for almost three percentage points. The wood, pulp and paper industries - ISIC 33 and 34 - represented by Stora and SCA, contributed four percent to domestic manufacturing value added in 1992, as did food processing - ISIC 31 - represented by newcomer Procordia.

Table 9 The largest Swedish manufacturing companies ranked according to domestic value adde in 1992

1 Dom. value added Rank 1992	2 Group	3 Total value added Rank 1992	4 Total value added 1992 MSEK	5 Dom. value added 1992 MSEK	6 Contribution to the manufacturing part of Swedish GDP 1992 (%)	7 ISIC	8 Main products
1	Volvo	3	17 294	11 251	4.4	38	Transport equipment
2	Procordia	4	16 861	10 065	4.0	31	Food processing
3	Ericsson	2	18 129	7 746	3.1	38	Electronics
4	Saab-Scania	8	10 753	7 313	2.9	38	Transport equipment
5	Stora	5	15 208	7 166	2.8	33,34	Wood, pulp and paper
6	Trelleborg	12	6 664	4 211	1.7	36	Goods from minerals
7	Electrolux	1	26 417	3 533	1.4	38	Machinery
8	Astra	10	8 316	3 442	1.4	35	Pharmaceuticals
9	SCA	7	11 069	3 385	1.3	33,34	Wood, pulp and paper
10	Nobel	11	8 303	3 366	1.3	35	Chemicals, explosives
	Total		139 014	61 478	24.3		

Table 9 shows the ranking according to domestic value added contribution. The top-ten group from such a ranking looks somewhat different from the one in Table 8: the biggest contributor (Electrolux) according to total value added finds itself in the lower half on such a list. Other changes are that Trelleborg and Nobel replace Sandvik and SKF. This yields a top-ten group contributing 24 percent to domestic value added in 1992. The top-ten group on a corresponding list for 1982 contributed 34 percent, with machinery, electronics and metal products as the main manufacturing subsectors.

4 STRUCTURAL DIFFERENCES - A NORDIC PERSPECTIVE

4.1 The knowledge intensity of Nordic industries

In Table 10, the top-ten companies in the Nordic countries are grouped by main activity and contribution to domestic value added. The table not only exhibits the distribution of activities, but also leads us into a discussion of the assumption of knowledge-intensive industries which was first addressed in the introduction of this paper. The knowledge-intensive activity groups (ISIC 35 and 38) are isolated in Table 10, thus revealing any change in the pattern of knowledge intensity among the top-ten manufacturing companies of the four countries.

Changes over time in the pattern of knowledge intensity can occur for a number of reasons. For instance, the sample companies may have undergone restructuring and completely altered their main activity. Nokia, for instance, has gone from a pulp and paper dominated company (ISIC 34) in 1982 to a company with electronics (ISIC 38) as main activity in 1992. Moreover, the 1992 group of companies may include one or more companies which were omitted from the corresponding 1982 group due to ineligibility according to the stock market listing criterion. Valmet, Outokumpu, Rautaruukki, Hafslund Nycomed and Procordia are examples of such companies. In order to reflect changes in knowledge intensity among the four

countries, contributions to domestic value added from these five companies have been included in the 1982 figures in Table 10.

The Danish top-ten group exhibited in 1992 a somewhat scattered pattern, as it did in 1982 when the same number of ISIC categories were represented. However, changes can be observed: product group 35 lost two companies to product group 36. The almost two percent lower knowledge content can be explained by the fact that the contributions to manufacturing value added from ISIC categories 31 and 38 decreased since 1982. This contradicts our a priori view of an "insider". Also, the number of knowledge-intensive companies among the top-ten group decreased over the period 1982-92.

Table 10 The top-ten companies of 1992 and 1982 by activity groups and contribution to domestic value added

Main activity (activity code - ISIC)	Number of companies 1992 and 1982 in							
	Denmark		Finland		Norway		Sweden	
	1992	1982	1992	1982	1992	1982	1992	1982
Food processing (31)	2(3.2)	2(5.3)			3(6.6)	1(2.1)	1(4.0)	1(2.8)
Textiles (32)								
Saw mills, pulp and paper (33,34)			4(15.2)	4(13.1)	1(2.0)	1(1.2)	2(4.1)	
Chemicals (35)	2(3.6)	4(3.5)			3(11.3)	4(13.0)	1(1.4)	
Goods from minerals (36)	3(1.4)	1(0.8)				1(1.9)		1(2.8)
Iron. steel. non-ferrous metals (37)			1(2.3)	1(2.0)	1(1.6)	1(2.5)	1(1.2)	
Machinery, metal products. electronics (38)	3(2.7)	3(4.7)	5(10.7)	5(9.4)	2(8.1)	2(5.0)	5(12.5)	8(28.2)
Other manufacturing (39)								
Total relative contribution to the domestic manufacturing value added;	10(10.9)	10(14.3)	10(28.2)	10(24.5)	10(29.6)	10(25.7)	10(23.2)	10(33.8)
of which the knowledge intensive part (ISIC 35+38) represents	5(6.3)	7(8.2)	5(10.7)	5(9.4)	5(19.4)	6(18.0)	6(13.9)	8(28.2)

Note: The 1982 top-ten groups have been altered to include companies that have been listed on the stock market between 1982 and 1992 and should have made a top-ten list in 1982. Concretely, this means that Valmet, Outokumpu and Rautaruukki have been included on the Finnish 1982 top-ten list, Hafslund Nycomed on the Norwegian 1982 top-ten list, and Procordia on the Swedish 1982 top-ten list. The Danish 1982 contribution figure differs from the one in Table 2 due to rounding off. Number of companies for each ISIC category is provided in the table together with (in brackets) the relative contribution from each ISIC category to the domestic manufacturing value added.

Although Valmet, Outokumpo (both ISIC category 38) and Rautaruukki (ISIC 37) are included in the Finnish 1982 figures in Table 10, activities within ISIC categories 33 and 34 were in dominance in 1982 as well as in 1992 in terms of contribution to domestic value added, but not in number of companies. Activity concentration remained unchanged, but relative contribution from all four ISIC groups to domestic value added increased over the period 1982-92. Thus, knowledge intensity increased over the period as well.

In Norway, activities within ISIC 31 and 38 increased their share of manufacturing value added, while ISIC category 35 decreased its share. The number of knowledge-intensive companies in the top-ten group decreased, but the knowledge intensity of the top-ten group nonetheless increased by 1.4 percentage points. Hafslund Nycomed was not eligible in 1982, since the company is the result of a merger between Hafslund and Nyegaard & Co in 1986. However, the combined 1982 value added figures for these two companies - at that time classified as ISIC 35 and 38 respectively - are included in the 1982 figures in Table 10. Some of the Norwegian ISIC 35 companies were outside the most knowledge-intensive part of that ISIC category (biochemics and pharmaceuticals). However, since remaining sectors of ISIC 35 are research-intensive as well (SCB, 1993), our conclusions about an upgrading of the Norwegian manufacturing industry still hold. In 1992, Norwegian top-ten companies were

represented in six ISIC categories, as compared to seven in 1982. Hence, the activity concentration increased slightly.

In Sweden, ISIC group 38 was still in dominance with five companies among the top-ten. This was, however, a significant reduction in numbers from 1982 when eight of the ten companies represented this product category. Furthermore, as opposed to 1982, when only three activity groups were represented on the list, as many as six were represented in 1992 (ISIC 31, 33, 34, 35, 37 and 38). This reveals a clear tendency towards a manufacturing industry with a significantly decreasing degree of knowledge intensity as well as activity concentration. In 1992, the knowledge-intensive product groups contributed 14 percent, as compared to 28 percent in 1982.

Hence, our hypothesis about a change away from knowledge-intensive activities for "outsiders" seems to fit for Sweden but not for Finland and Norway. Also, the observation for Denmark contradicts our a priori view about an unchanged or increased knowledge intensity of "insider" countries.

4.2 Real growth of Nordic manufacturing industries

In Table 11, the real percentage growth in value added for the top-ten companies, as well as for the manufacturing part of GDP and total GDP, is displayed. As in Table 10, the 1982 top-ten lists for Finland, Norway and Sweden have been modified to include Valmet, Outokumpu, Rautaruukki, Hafslund Nycomed and Procordia. None of the four countries showed negative real growth in total domestic manufacturing value added between 1982 and 1992. The real growth in the domestic part of the Danish manufacturing value added was by far the highest (55 percent), while the Norwegian industry exhibited the lowest real growth figure.

When it comes to the top-ten groups of companies, the highest real growth in total value added was exhibited by the Finnish group. The Finnish as well as the Norwegian top-ten groups exhibited real growth in total as well as domestic value added which was higher than real growth in total domestic manufacturing value added. Thus, two of the three "outsiders" - Finland and Norway - experienced an increased concentration (as was also shown in the previous table), depicted by a relative increase in the top-ten group's contribution to the value added in domestic manufacturing industries, while Denmark, the "insider", and Sweden experienced a decreased concentration.

A comparison between total GDP and the manufacturing part of GDP for the four countries in terms of real growth during 1976-82, 1982-92 and 1976-92 is also shown in Table 11. Denmark's high growth in manufacturing value added between 1982 and 1992 was almost exactly reflected in real growth in total GDP. The other three Nordic countries exhibited real growth in manufacturing GDP decisively lower than that of total GDP. Looking at real growth between 1976 and 1992, Danish manufacturing GDP grew at a rate 17 percentage points faster than total GDP. The three "outsiders" exhibited real growth in manufacturing GDP between 40 to 60 percentage points lower than total GDP.

Table 11 Real percentage growth in value added

Country	Real growth in total value added for the top-ten group	Real growth in domestic value added for the top-ten group	Real growth in the manufacturing part of GDP			Real growth in total GDP		
	1982-92	1982-92	1976-82	1982-92	1976-92	1976-82	1982-92	1976-92
Denmark	64	18	10	55	71	0	54	54
Finland	113	42	10	23	35	21	58	91
Norway	58	22	-5	6	1	31	12	46
Sweden	17	-15	-15	23	5	3	42	46

Note: Denmark's, Finland's and Norway's real growth figures have been deflated using indices for wholesale prices. Sweden's real growth figures have been deflated with indices for producer prices within ISIC category 3. As in Table 10, the Finnish 1982 top-ten group has been modified so as to include Valmet, Outokumpo and Rautaruukki, the Norwegian 1982 top-ten group to include Hafslund Nycomed, and the Swedish to include Procordia.

4.3 Size distribution of Nordic manufacturing companies

In Table 12, the relative sizes among the 40 top-ten companies within as well as between the countries are illustrated. Swedish companies were in 1992 still giants compared to their Danish, Norwegian and Finnish counterparts. In 1992, as opposed to the situation in 1982, there was no longer one single extremely large company in Sweden pulling up the sales average. Volvo, was still the largest company according to sales, closely followed, however, by Electrolux and the other Swedish top-ten companies. This fact explains the moderate discrepancy between the average and median figures. Norway, on the other hand, did harbor one outlier among the top-ten group of companies, namely Norsk Hydro. Neither in Denmark, nor in Finland can such an outlier be found among the top-ten companies. Complete ranking lists can be found in appendices 1 to 5.

Among the ten largest top-ten companies according to total sales, only two companies were non-Swedish, namely Norsk Hydro (third place) and Repola (eighth place). Ranking the forty top-ten companies according to total value added, the same two companies among the top-twelve were the only non-Swedish ones.

When the forty companies are ranked according to 1992 sales abroad, SKF takes first place with 97 percent. In second, third and fourth place, we find the Danish, Norwegian and Finnish companies Novo, Elkem and Kone. The Finnish top-ten companies exhibited the highest figures, with an average of 84 percent (the median was 84 as well). The Swedish group was closest with an average of 82 percent (median 87 percent).

4.4 Profit development

A ranking of the 29 top-ten companies (that reported profits in 1992) according to the size of their profits before tax puts two Swedish companies, Astra and Procordia, in front of the Danish Novo. The Finnish top-ten company with the highest pre-tax income in 1992 was Nokia, ranked number nine on the list. Norway's Norsk Hydro is in fifth place, closely followed by Hafslund Nycomed. Of the 40 top-ten companies, 11 exhibited a loss before tax. In 1992, the recession hit Swedish industry hard and the Swedish manufacturing industry experienced its worst profitability since 1978 (SCB, 1992). The problem is illustrated by the fact that the four companies exhibiting greatest loss on the loss-list were all Swedish, Volvo being the

Table 12 Relative sizes of the Nordic national top-ten companies in 1992

		Denmark	Finland	Norway	Sweden
Average total sales in the top-ten group	MSEK	7 075	16 262	13 949	41 601
Median total sales in the top-ten group	MSEK	5 879	14 003	7 169	36 114
The highest and lowest ranking - among the 40 manufacturing companies according to total sales	HIGHEST	20	8	3	1
	LOWEST	40	28	36	18
The highest and lowest ranking according to profits - among the 29 manufacturing companies exhibiting profits before tax	HIGHEST	3	9	5	1
	LOWEST	28	29	23	17
The highest and lowest ranking according to loss - among the 11 manufacturing companies exhibiting loss before tax	HIGHEST	11	7	5	1
	LOWEST	11	10	6	4
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to share of sales abroad	HIGHEST	2	4	3	1
	LOWEST	37	26	40	34
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to share of employees abroad	HIGHEST	5	3	4	1
	LOWEST	39	36	40	27
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to total number of employees	HIGHEST	21	10	7	1
	LOWEST	40	28	36	25
Average total value added in the top-ten group	MSEK	2 531	5 961	4 681	14 437
Median total value added in the top-ten group	MSEK	1 728	5 083	2 739	13 583
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to total value added	HIGHEST	18	8	5	1
	LOWEST	40	27	36	12
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to total value added share of total sales	HIGHEST	2	7	1	4
	LOWEST	39	30	38	40
Average domestic value added in the top-ten group	MSEK	1 476	3 389	2 604	5 879
Median domestic value added in the top-ten group	MSEK	10 779	3 289	1 587	5 350
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to domestic value added	HIGHEST	12	7	3	1
	LOWEST	40	34	39	26
The highest and lowest ranking - among the 40 top-ten manufacturing companies according to domestic value added share of total sales	HIGHEST	1	5	7	9
	LOWEST	37	39	36	40

biggest loser. Denmark had only one representative among the loss-companies: Bang & Olufssen, in 11th place, while Norway had two representatives and Finland had four.

4.5 Employment development

The biggest top-ten employer in 1992 was Electrolux with more than 120 000 employees. The highest-ranked non-Swedish company among the 40 top-ten companies was Norsk Hydro, which ranked seventh. The Finnish companies Repola and Nokia were ranked tenth and eleventh respectively. The highest ranked Danish employer was Danisco in 21st place, which was four places ahead of the lowest ranked Swedish employer (Astra).

Looking at the 1992 share of employees employed abroad, we find two Swedish companies in the first two places with more than 85 percent employed abroad (Electrolux and SKF). With 84 percent of employees abroad, the Finnish company Kone came in third place, followed by Dyno (Norway) and Jens Villadsen (Denmark), both with 75 percent of their staff employed abroad. One company employed less than five percent of its personnel abroad in 1992: Norske Skogsindustrier. No Swedish nor Finnish top-ten company employed less than 15 percent abroad. The Swedish top-ten companies exhibited the highest figures, averaging 58 percent and a median of the same. Finnish top-ten companies were closest, with an average of 42 percent and a median of 36 percent of all employees abroad.

In Table 13, the number of domestic employees as a percentage of the total number of employees for the 1982 and the 1992 top-ten groups of companies is listed. All four top-ten groups exhibited a noticeable decrease in the share of domestic employees, illustrating the ongoing process of internationalization, as was also emphasized in Heum and Ylä-Anttila (1992).

Table 13 Domestic employees as a percentage of the total number of employees for the 1982 and 1992 top-ten groups

Country	1982	1992	Decrease 1982-92, percent
Denmark	81	58	28
Finland	85	57	33
Norway	72	56	23
Sweden	56	41	27

Note: The 1982 figures are based on the modified top-ten list as used in Table 10, i.e. Valmet, Outokumpu and Rautaruukki are included in the Finnish 1982 figures, Hafslund Nycomed in the Norwegian 1982 figures, and Procordia in the Swedish.

4.6 Value added as share of sales

Ranking the companies according to total and domestic value added as a percentage of total sales, we find that no Finnish company exhibited total value added as share of total sales higher than 45 percent. The highest ratio was diplayed by the Norwegian chemical company Hafslund Nycomed (63 percent), while the lowest was displayed by Volvo (21 percent). The highest ratio according to domestic value added as share of total sales was displayed by Danish Royal Copenhagen, a midget in size compared to Electrolux, which exhibited the lowest figure, four percent.

4.7 The market value of Nordic manufacturing companies

On a global ranking of the world's 1000 highest ranked companies according to market value in 1992, 11 of the 40 Nordic top-ten companies were represented (Business Week, 1993a). Eight companies were Swedish, two Danish (Novo, place 610 and Carlsberg, place 618) and one Norwegian (Norsk Hydro, place 337). The highest ranked was Astra, in place 115, followed by Procordia in place 217. The other Swedish top-ten companies were: Volvo (354), Ericsson (367), Sandvik (549), Electrolux (584), SCA (585) and Stora (637). In all, ten Swedish companies, five Danish and one Norwegian were represented. No Finnish company was to be found in the 1992 global group of 1000.

4.8 Nordic companies - Germanic or Anglo-Saxon types

Based on our value added observations, what can be stated about the Nordic type of companies? Do they belong to the Germanic or Anglo-Saxon type? According to de Jong (1993) a large share of wages and social costs in net value added is typical for the Germanic type of social market capitalism in which various groups - management, shareholders, employees and banks - have a stake in the control of the corporation. This form is characterized by employee influence and by being highly bank-oriented, while in the other extreme - the Anglo-Saxon type of free market capitalism - shareholder sovereignty and market for corporate control are the main characteristic features. De Jong claims that a distinction exists between the two systems in terms of the share of labor costs in net value added as well as in the size of value added. For European top-hundred companies he reports the share of labor costs in net value added to be about 80 percent, with the Anglo-Saxon companies in this group having an average of 68 percent and Germanic companies an average well above 80 percent. The Anglo-Saxon type of company is dominated by the interests of capital suppliers, gives less weight to labor and is to be seen as profit oriented, whereas the Germanic type is sales and growth oriented. De Jong finds a low value added to characterize Anglo-Saxon companies and reports a net value added for UK companies in the European top-hundred group systematically below the median value of the group. He finds the Norwegian and Swedish companies in the top-hundred group to be equally distributed around the median of the group. Hence, in this particular respect, there is no clear signal for them as being either Germanic or Anglo-Saxon typed.

A similar distinction is found when risks are considered. In such a context, an Anglo-Saxon type exists in terms of the "shareholder wealth maximization" view as opposed to a Germanic or European type in terms of the "corporate wealth maximization" view (see Stonehill & Dullum, 1990). This difference in view may shed some extra light on the value added distribution. Assume, for instance, that management plays the role of a risk manager. In such case, on an average, profits are reduced by an amount equal to the transaction costs linked to the insurance. The consequence will be a correspondingly higher share of labor costs to value added.

The figures in Table 14 underpin the view of Nordic manufacturing industries as belonging to the Germanic type of social market capitalism in 1992. However, also in this case the Danish industries stand out as somewhat different from the industries in the other Nordic countries, and as opposed to them, the Danish industries in 1982 seemed to be of the Anglo-Saxon type, although in 1992 they came closer to the Germanic type.

Table 14 Wages and social costs as a percentage of the value added in 1982 and 1992 for the top-ten groups of companies of those years

	Denmark		Finland		Norway		Sweden	
	1982	1992	1982	1992	1982	1992	1982	1992
of total	49	66	66	68	65	64	74	76
of net total	55	74	73	83	77	79	80	89

4.9 The representativity of the sample of companies

The reasons why we imposed the stock market listing criterion was to increase the probability of acquiring data at the corporate level as well as to avoid including companies that were state-owned and not managed in accordance with generally agreed business principles. A crucial question is to what extent this criterion affected the results. Hence, let us here turn to a discussion about the robustness of our findings. Regarding the Danish sample, two large manufacturing companies not listed on the Danish stock exchange were M D Foods (ISIC 31) and Danfoss (ISIC 38). Including these companies on the 1992 top-ten list, the 1992 contribution to domestic value added would be half a percentage point larger than as exhibited in Tables 2 and 10. The knowledge intensity would be 0.8 percentage points higher than as exhibited in Table 10. In 1982, only Danfoss would have made the top-ten list. Thus, knowledge intensity over the 1982-92 period for a top-ten group including Danfoss and M D Foods would have dropped 2.4 percentage points, as compared to 1.9 percentage points as exhibited in Table 10. This result supports the robustness of our original findings. Companies that would have made the top-ten list according to value added in general,, but excluded as being outside the manufacturing sector are EAC, Østasiatiske, and Sophus Berendsen, conglomerates, the Lauritzen Group in the transportation sector, and Monberg & Thorsen with trading of pharmaceuticals as its main activity. Other candidates were a couple of subsidiaries of foreign groups, such as A/S Dansk Shell, Statoil and Kuwait Petroleum A/S.

The largest Finnish company in terms of sales, chemicals-based Neste, reported sales more than twice that of Repola. Neste was however not listed on the Finnish stock market, and was thus not eligible to be a top-ten company in this study. Another large non-listed Finnish company in the chemicals sector was Kemira. Both these companies were 100 percent state-owned. If the stock market listing criterion were dropped, they would have made the 1982 top-ten list as well as the 1992 top-ten list. The 1992 contribution to domestic value added would only be 0.2 percentage points higher than as exhibited in Tables 4 and 10, and the knowledge intensity would have experienced an increase of three percentage points between 1982 and 1992, as compared to an increase of just over one percentage point as exhibited in Table 10. Hence, the robustness of our results in terms of knowledge intensity is verified. According to sales, the non-manufacturing company Kesko was larger than all the Finnish top-ten companies. Kesko, which is a trading company, would probably be on a general value added top-ten list, although, in terms of number of employees, Kesko is much smaller than all the top-ten companies.

In Norway, we found no companies belonging to ISIC categories 31-39 large enough to make it on the Norwegian top-ten list, but excluded from it as not being listed on the stock market. Statoil, however, would definitely have made a general top-ten list. Its value added contribution was high enough to put it among the top-five companies. However, since it was neither listed on the stock exchange nor a manufacturing company belonging to ISIC category

3, it was not included in this study. Another oil-company, Saga Petroleum, would also have made a general top-ten list of companies.

In the case of the Swedish 1992 top-ten list, ABB, whose reported sales were the size of Volvo's and Electrolux's put together, was not considered a Swedish company (not only have Asea's manufacturing facilities expanded abroad, its headquarters were also located abroad). Hence, it was not included among the top-ten companies in this study. Another company with close relations to Sweden, but not considered a Swedish company in 1982 or in 1992, was Tetra Pak. After the acquisition of Alfa Laval in the fall of 1991, Tetra Laval was formed on the first of January, 1993. The Alfa Laval stock was removed from the stock market in October, 1991. Thus, as of the annual report in 1990, financial data for the Alfa Laval concern was not available. However, the consolidated 1992 value added figures for the company Tetra Pak Alfa Laval indicate that this company would not have made a Swedish domestic value added top-ten list. Regarding knowledge intensity, the findings from the top-ten group were consistent with those for the whole Swedish manufacturing industry as reported by Braunerhjelm and Oxelheim (1992). A handful of Swedish companies not belonging to category 3, would qualify to be among the top-ten companies according to general total value added: Skanska, the largest construction company in Sweden (classification 5); KF-koncernen, ICA and Axel Johnsson, trading companies which were among the Swedish top-ten list in terms of sales, and state-owned Televerket.

5 CONCLUDING REMARKS

The dramatic out-flows of FDI in the second half of the 1980s and the beginning of the 1990s changed the core of the manufacturing industries in the Nordic countries, but some patterns registered for the 1976 and 1982 situations still held true in 1992. For instance, the Swedish top-ten companies remained gigantic compared to the corresponding companies in the other Nordic countries. However, in many other respects the industrial patterns as reflected in the activities of top-ten companies in Finland, Norway and Sweden have been converging, while the Danish pattern differs. For instance, the relative size of total global value added of the Finnish, Norwegian and Swedish top-ten groups has converged. So also has contribution to domestic value added. In this respect, in 1992, the Finnish and Norwegian top-ten groups have not only managed to reach the proportion of the Swedish top-ten group, but also to pass it.

The profile of changes as exhibited by the activities of the top-ten manufacturing companies of each country is summarized in Table 15. The Swedish manufacturing industry experienced a noticeable decrease in knowledge intensity over the studied period, more than halving the value added contribution of the two knowledge-intensive activity groups to the manufacturing part of GDP. This result is in line with our a priori view. However, the situation for the other two "outsider" countries was different in that the Finnish as well as the Norwegian manufacturing industries experienced an increase in knowledge intensity over the same period. In 1992, the domestic value added part of the Norwegian top-ten group exhibited the highest knowledge intensity among the Nordic top-ten groups.

The explanation for the rejection of our hypothesis concerning Finland and Norway may be the fact that the three "outsider" countries' industries started from different points in the upgrading cycle. Since the mid-1970s, Swedish manufacturing industries have exhibited one of the highest R&D intensities among the industrial countries: Sweden for many years was second to the US in terms of industrial R&D expenditures as a percentage of value added (OECD, 1986 and 1992), while the R&D intensity in Denmark, Finland and Norway has been about half the

Swedish intensity. Hence, a clear difference between Sweden and the other Nordic countries exists in this regard.

Table 15 Nordic national top-ten manufacturing company profiles 1982-92

	Denmark	Finland	Norway	Sweden
Size of total manufacturing sector as a share of domestic GDP	Unchanged	Decreasing	Decreasing	Decreasing
Degree of internationalization	Increasing	Increasing	Increasing	Increasing
Degree of knowledge intensity of the domestic value added contribution	Decreasing	Increasing	Increasing	Decreasing
Real growth rate as compared to that of the whole domestic manufacturing industry	Lower	Higher	Higher	Lower
Degree of size concentration (relative contribution to domestic value added)	Decreasing	Increasing	Increasing	Decreasing
Degree of activity concentration	Unchanged	Unchanged	Increasing	Decreasing

Business Week (1993b) published a list of the top 200 R&D spenders around the world. Fifteen Swedish, three Finnish, one Norwegian and no Danish companies were found on this list. In nominal figures, the highest expenditures among the Nordic companies were reported by Volvo (number 19 on the list) and Ericsson (22). Nokia (80) and Hafslund Nycomed (135) were the top R&D companies of Finland and Norway respectively. Hence, a satisfactory explanation to the difference between Sweden on the one hand and Finland and Norway on the other may be that the Swedish manufacturing top-ten companies, at the time they were confronted with the challenge of the EC 1992 program, were larger and more knowledge-intensive than their Finnish and Norwegian counterparts. Since they had more or less grown out of the domestic market, their propensity to outlocate production was higher than that of the Finnish and Norwegian top-ten manufacturing companies that were still in a process of upgrading. Moreover, the propensity of the Norwegian knowledge-intensive companies in the petro-chemical sector to outlocate production may also have been low, since the main natural resource - oil - was, and still is, present and readily available at home.

The Danish manufacturing industry, which according to our hypothesis should have experienced an upgrading of its knowledge intensity, in fact experienced a downgrading. This result is more difficult to explain, but may partly reflect that when investment diverting policies work on companies based in "outsider" countries, these companies prefer to locate production in "insider" countries with big markets and/or low production costs. Denmark offered neither of these advantages, and thus received little FDI from its Nordic neighbors or from other "outsiders". Moreover, the Danish type of manufacturing specialization offered few network opportunities that could have attracted inward investments.

All the 40 top-ten companies in 1992 exhibited higher real growth in value added abroad than at home for the period 1982-92, indicating a strong trend of internationalization. However, in Finland and Norway, the top-ten companies were still growing faster domestically than the entire domestic manufacturing sector, implying an increasing degree of concentration in these countries. Thus, the Finnish and Norwegian top-ten companies have been acting as engines in the domestic growth process. In Denmark and Sweden, the domestic value added by the top-ten groups exhibited lower real growth than the total domestic manufacturing industry, and a decreasing concentration was registered.

References

Braunerhjelm, P. (1990), *Svenska industriföretag inför EG 1992*, Stockholm: The Industrial Institute for Economic and Social Research.

Braunerhjelm, P. and Oxelheim, L. (1992), "Heckscher-Ohlin and Schumpeter Industries: The Response by Swedish Multinational Firms to the EC 1992 Program", *Working Paper 352*, Stockholm: The Industrial Institute for Economic and Social Research.

Business Week (1993a), *More for Less*, June 28.

Business Week (1993b), *The Global 1000*, July 12.

De Jong, H.W. (1993), "European Capitalism: between freedom and social justice", *Conference paper* presented at the EAIRIE conference in Tel Aviv: September.

Eliasson, G. et al (1990), *The Knowledge Based Information Economy*, Stockholm: The Industrial Institute for Social and Economic Research

Heum, P. and Ylä-Anttila, P. in co-operation with Braunerhjelm, P. and Thomsen, S. (1992), "Firm Dynamics in a Nordic Perspective", *Working Paper*, SNF and ETLA, Helsinki.

Hirsch, S. and Thomsen, S. (1993), "Large Industrial Firms in Small Economies", *Working Paper 3-93*, The Institute for International Economy and Management, Copenhagen.

OECD (1992), *International Direct Investments: Policies and Trends in the 1980s*, Paris.

OECD (1986, 1992), *OECD Science and Technology Indicators*, Paris (various issues).

Oxelheim, L. (1984), "The Largest Nordic Manufacturing Companies", in DØR et al, *Economic Growth in a Nordic Perspective*, Helsinki.

Oxelheim, L. (1993), *Small National Financial Markets in Transition,* London: Routledge (forthcoming).

Ozawa, T. (1992) "Cross-investment between Japan and the EC: Income Similarity, Product Variation and Economies of Scope", in Cantwell, J. (ed.) *Multinational Investment in Modern Europe: Strategic Interaction in the Integrated Community*, Edward Elgar Publishing Co.

Rugman, A. and Verbeke, S. (1991) "Competitive Strategies for Non-European Firms", in Burgenmeier, B. and Mucchielli, J.L (eds)(1991), *Multinationals and Europe 1992*, London: Routledge.

SCB (1992), "Större Industriföretag", *Företag*, National Statistical Office of Sweden, Stockholm.

SCB (1993), *Science and Technology Indicators*, National Statistical Office of Sweden, Stockholm.

Stonehill, A. and Dullum, K.B. (1990), "Corporate Wealth Maximization, Takeovers and the Market for Corporate Control", *Nationaløkonomisk Tidskrift*, Copenhagen.

Sweeney, R. (1993), "The International Competition for Foreign Direct Investment", in Oxelheim, L. (ed.) *The Global race for Foreign Direct Investment in the 1990s,* Berlin: Springer Verlag.

US International Trade Commission (1992), *The Effects of Greater Economic Integration within the European Community on the United States: Fourth Following Report*, Washington.

Yamawiki, H. (1990) "Locational Decisions of Japanese Multinational Firms in European Manufacturing Industries", *Mimeo*, Berlin: Science Center.

Yannopoulous, G. (1990) "Foreign Direct Investment and European Integration: Evidence from the Formative Years of the European Community", *Journal of Common Market Studies*, Vol. 28, pp.235-259.

Yannopoulous, G. (1992) "Multinational Corporations and the Single European Market", in Cantwell, J. (ed.) *Multinational Investment in Modern Europe*, Brookfield: Edward Elgar Publishing Co.

Appendix 1 - Rankings According to Sales

Table 1
The 40 top-ten companies ranked according to sales in MSEK

Rank	Company		Sales, MSEK
1	VOLVO	Se	83 002
2	Electrolux	Se	80 436
3	Norsk Hydro	No	54 358
4	Ericsson	Se	47 020
5	Stora	Se	46 895
6	Procordia	Se	40 090
7	SCA	Se	32 137
8	Repola	Fi	30 880
9	Saab-Scania	Se	26 992
10	SKF	Se	26 649
11	Nokia	Fi	23 620
12	Outokumpu	Fi	19 664
13	Kvaerner	No	18 729
14	Kymmene	Fi	17 690
15	Sandvik	Se	17 217
16	Aker	No	16 226
17	Orkla	No	15 735
18	Astra	Se	15 568
19	Kone	Fi	14 664
20	Carlsberg	Dk	14 423
21	Enso-Gutzeit	Fi	13 343
22	Danisco	Dk	12 988
23	Valmet	Fi	12 539
24	Metra	Fi	11 683
25	FLS Industrier	Dk	11 649
26	Novo	Dk	10 317
27	Metsä-Serla	Fi	10 078
28	Rautaruukki	Fi	8 460
29	Norske Skogsindustrier	No	7 335
30	Dyno	No	7 003
31	Superfos	Dk	6 939
32	Elkem	No	6 834
33	Freia Marabou	No	5 042
34	Hafslund Nycomed	No	4 853
35	NKT	Dk	4 819
36	Rieber & Son	No	3 375
37	Jens Villadsen	Dk	3 241
38	Aalborg Portland Holding	Dk	2 563
39	Bang & Olufssen	Dk	2 160
40	Royal Copenhagen	Dk	1 645

Table 2
The 40 top-ten companies ranked according to sales abroad as per cent of total sales

Rank	Company		Sales abroad (%)
1	SKF	Se	97
2	Novo	Dk	96
3	Elkem	No	96
4	Kone	Fi	94
5	Sandvik	Se	93
6	Outokumpu	Fi	92
7	Metra	Fi	91
8	Electrolux	Se	90
9	Norsk Hydro	No	88
10	VOLVO	Se	87
11	Ericsson	Se	87
12	Astra	Se	87
13	Dyno	No	86
14	Jens Villadsen	Dk	85
15	Enso-Gutzeit	Fi	84
16	Kymmene	Fi	83
17	Metsä-Serla	Fi	83
18	Stora	Se	81
19	SCA	Se	80
20	Repola	Fi	80
21	Nokia	Fi	80
22	Hafslund Nycomed Nycon	No	77
23	Bang & Olufssen	Dk	77
24	Valmet	Fi	76
25	FLS Industrier	Dk	76
26	Rautaruukki	Fi	73
27	Carlsberg	Dk	70
28	Norske Skogsindustrier	No	70
29	Saab-Scania	Se	69
30	Freia Marabou	No	67
31	Kvaerner	No	66
32	Danisco	Dk	63
33	NKT	Dk	63
34	Procordia	Se	52
35	Superfos	Dk	44
36	Aalborg Portland Holding	Dk	39
37	Royal Copenhagen	Dk	38
38	Aker	No	36
39	Orkla	No	28
40	Rieber & Son	No	26

Appendix 2 - Rankings According to Profits/Loss

Table 1
The 29 top-ten companies reporting profits ranked according to profits before tax, MSEK

Rank	Company		Profits before tax, MSEK
1	Astra	Se	5 120
2	Procordia	Se	4 865
3	Novo	Dk	1 617
4	Sandvik	Se	1 497
5	Norsk Hydro	No	1 390
6	Hafslund Nycomed	No	1 331
7	Carlsberg	Dk	1 315
8	Ericsson	Se	1 306
9	Nokia	Fi	1 049
10	Danisco	Dk	1 015
11	Electrolux	Se	929
12	Kvaerner	No	873
13	Metsä-Serla	Fi	573
14	Kone	Fi	557
15	Freia Marabou	No	500
16	Metra	Fi	462
17	SCA	Se	451
18	FLS Industrier	Dk	377
19	Aker	No	345
20	Orkla	No	295
21	Rieber & Son	No	245
22	Aalborg Portland Holding	Dk	176
23	Dyno	No	150
24	Enso-Gutzeit	Fi	147
25	Jens Villadsen	Dk	124
26	Superfos	Dk	74
27	Royal Copenhagen	Dk	57
28	NKT	Dk	55
29	Outokumpu	Fi	20

Table 2
The 11 top-ten companies reporting loss ranked according to loss before tax, MSEK

Rank	Company		Loss before tax, MSEK
1	VOLVO	Se	-3 312
2	SKF	Se	-1 777
3	Stora	Se	-1 359
4	Saab-Scania	Se	-684
5	Elkem	No	-630
6	Norske Skogsindustrier	No	-617
7	Rautaruukki	Fi	-571
8	Repola	Fi	-297
9	Kymmene	Fi	-277
10	Valmet	Fi	-78
11	Bang & Olufssen	Dk	-29

Appendix 3 - Rankings According to Number of Employees

Table 1
The 40 top-ten companies ranked according to total number of employees

Rank	Company		Total number of employees
1	Electrolux	Se	121 148
2	Ericsson	Se	64 637
3	VOLVO	Se	60 635
4	SKF	Se	46 672
5	Procordia	Se	40 070
6	Stora	Se	38 881
7	Norsk Hydro	No	34 036
8	SCA	Se	29 623
9	Saab-Scania	Se	28 759
10	Repola	Fi	26 856
11	Nokia	Fi	26 770
12	Sandvik	Se	25 599
13	Kvaerner	No	23 011
14	Kone	Fi	21 426
15	Outokumpu	Fi	17 524
16	Valmet	Fi	17 204
17	Kymmene	Fi	16 950
18	Aker	No	16 309
19	Metra	Fi	15 122
20	Orkla	No	14 679
21	Danisco	Dk	14 019
22	Enso-Gutzeit	Fi	13 918
23	Carlsberg	Dk	13 777
24	FLS Industrier	Dk	12 268
25	Astra	Se	11 288
26	Novo	Dk	10 733
27	Rautaruukki	Fi	9 281
28	Metsä-Serla	Fi	9 096
29	Dyno	No	7 463
30	NKT	Dk	6 692
31	Elkem	No	6 000
32	Freia Marabou	No	5 252
33	Norske Skogsindustrier	No	5 016
34	Superfos	Dk	4 581
35	Hafslund Nycomed Nycom	No	4 094
36	Rieber & Son	No	3 753
37	Bang & Olufssen	Dk	3 180
38	Royal Copenhagen	Dk	3 179
39	Jens Villadsen	Dk	3 131
40	Aalborg Portland Holding	Dk	2 583

Table 2
The 40 top-ten companies ranked according to share of staff employed abroad

Rank	Company		Share employed abroad (%)
1	Electrolux	Se	87
2	SKF	Se	85
3	Kone	Fi	84
4	Dyno	No	75
5	Jens Villadsen	Dk	75
6	Metra	Fi	72
7	SCA	Se	69
8	Sandvik	Se	63
9	Astra	Se	59
10	Kvaerner	No	58
11	Ericsson	Se	57
12	FLS Industrier	Dk	57
13	Hafslund Nycomed	No	54
14	Danisco	Dk	54
15	Stora	Se	53
16	Outokumpu	Fi	52
17	Norsk Hydro	No	51
18	Carlsberg	Dk	50
19	Nokia	Fi	49
20	Superfos	Dk	45
21	Procordia	Se	40
22	Repola	Fi	39
23	VOLVO	Se	35
24	Valmet	Fi	33
25	Freia Marabou	No	33
26	Rieber & Son	No	32
27	Saab-Scania	Se	32
28	NKT	Dk	31
29	Metsä-Serla	Fi	29
30	Aker	No	28
31	Novo	Dk	27
32	Kymmene	Fi	25
33	Elkem	No	25
34	Rautaruukki	Fi	22
35	Orkla	No	19
36	Enso-Gutzeit	Fi	18
37	Royal Copenhagen	Dk	13
38	Bang & Olufssen	Dk	9
39	Aalborg Portland Holding	Dk	8
40	Norske Skogsindustrier	No	2

Appendix 4 - Rankings According to Total Value Added

Table 1
The 40 top-ten companies ranked according to total value added

Rank	Company		Total value added, MSEK
1	Electrolux	Se	26 417
2	Ericsson	Se	18 129
3	VOLVO	Se	17 294
4	Procordia	Se	16 861
5	Norsk Hydro	No	16 222
6	Stora	Se	15 208
7	SKF	Se	11 958
8	Repola	Fi	11 125
9	SCA	Se	11 069
10	Saab-Scania	Se	10 753
11	Sandvik	Se	8 368
12	Astra	Se	8 316
13	Nokia	Fi	7 898
14	Kvaerner	No	7 082
15	Outokumpu	Fi	6 777
16	Kymmene	Fi	6 350
17	Aker	No	5 740
18	Novo	Dk	5 625
19	Orkla	No	5 339
20	Kone	Fi	5 164
21	Valmet	Fi	5 003
22	Enso-Gutzeit	Fi	4 996
23	Metra	Fi	4 868
24	Danisco	Dk	4 781
25	Carlsberg	Dk	4 331
26	Metsä-Serla	Fi	3 809
27	Rautaruukki	Fi	3 617
28	FLS Industrier	Dk	3 344
29	Hafslund Nycomed	No	3 064
30	Dyno	No	2 414
31	Freia Marabou	No	2 129
32	NKT	Dk	1 895
33	Elkem	No	1 870
34	Norske Skogsindustrier	No	1 802
35	Superfos	Dk	1 560
36	Rieber & Son	No	1 153
37	Jens Villadsen	Dk	1 066
38	Aalborg Portland Holding	Dk	927
39	Royal Copenhagen	Dk	899
40	Bang & Olufssen	Dk	878

Table 2
The 40 top-ten companies ranked according to total value added as share of sales

Rank	Company		Total value added as share of sales (%)
1	Hafslund Nycomed Nycom	No	63
2	Royal Copenhagen	Dk	55
3	Novo	Dk	55
4	Astra	Se	53
5	Sandvik	Se	49
6	SKF	Se	45
7	Rautaruukki	Fi	43
8	Procordia	Se	42
9	Freia Marabou	No	54
10	Metra	Fi	42
11	Bang & Olufssen	Dk	41
12	Valmet	Fi	40
13	Saab-Scania	Se	40
14	NKT	Dk	39
15	Ericsson	Se	39
16	Kvaerner	No	38
17	Metsä-Serla	Fi	38
18	Enso-Gutzeit	Fi	37
19	Danisco	Dk	37
20	Aalborg Portland Holding	Dk	36
21	Repola	Fi	36
22	Kymmene	Fi	36
23	Aker	No	35
24	Kone	Fi	35
25	Dyno	No	34
26	Outokumpu	Fi	34
27	SCA	Se	34
28	Rieber & Son	No	34
29	Orkla	No	34
30	Nokia	Fi	33
31	Jens Villadsen	Dk	33
32	Electrolux	Se	33
33	Stora	Se	32
34	Carlsberg	Dk	30
35	Norsk Hydro	No	30
36	FLS Industrier	Dk	29
37	Elkem	No	27
38	Norske Skogsindustrier	No	25
39	Superfos	Dk	22
40	VOLVO	Se	21

Appendix 5 - Rankings According to Domestic Value Added

Table 1
The 40 top-ten companies ranked according to domestic value added

Rank	Company		Domestic value added, MSEK
1	VOLVO	Se	11 251
2	Procordia	Se	10 065
3	Norsk Hydro	No	7 937
4	Ericsson	Se	7 746
5	Saab-Scania	Se	7 313
6	Stora	Se	7 166
7	Repola	Fi	6 737
8	Kymmene	Fi	4 756
9	Orkla	No	4 308
10	Aker	No	4 143
11	Enso-Gutzeit	Fi	4 107
12	Novo	Dk	4 085
13	Nokia	Fi	4 058
14	Electrolux	Se	3 533
15	Astra	Se	3 442
16	SCA	Se	3 385
17	Valmet	Fi	3 335
18	Outokumpu	Fi	3 242
19	Sandvik	Se	3 128
20	Kvaerner	No	2 995
21	Rautaruukki	Fi	2 804
22	Metsä-Serla	Fi	2 702
23	Danisco	Dk	2 217
24	Carlsberg	Dk	2 165
25	Norske Skogsindustrier	No	1 761
26	SKF	Se	1 760
27	FLS Industrier	Dk	1 438
28	Hafslund Nycomed	No	1 413
29	Elkem	No	1 402
30	Metra	Fi	1 343
31	NKT	Dk	1 304
32	Aalborg Portland Holding	Dk	854
33	Superfos	Dk	851
34	Kone	Fi	809
35	Bang & Olufssen	Dk	796
36	Royal Copenhagen	Dk	785
37	Rieber & Son	No	780
38	Freia Marabou	No	704
39	Dyno	No	600
40	Jens Villadsen	Dk	268

Table 2
The 40 top-ten companies ranked according to domestic value added as share of sales

Rank	Company		Dom. value added as share of sales (%)
1	Royal Copenhagen	Dk	48
2	Novo	Dk	40
3	Bang & Olufssen	Dk	37
4	Aalborg Portland Holding	Dk	33
5	Rautaruukki	Fi	33
6	Enso-Gutzeit	Fi	31
7	Hafslund Nycomed Nycom	No	29
8	Orkla	No	27
9	Saab-Scania	Se	27
10	NKT	Dk	27
11	Kymmene	Fi	27
12	Metsä-Serla	Fi	27
13	Valmet	Fi	27
14	Aker	No	26
15	Procordia	Se	25
16	Norske Skogsindustrier	No	24
17	Rieber & Son	No	23
18	Astra	Se	27
19	Repola	Fi	22
20	Elkem	No	21
21	Sandvik	Se	18
22	Nokia	Fi	17
23	Danisco	Dk	17
24	Outokumpu	Fi	16
25	Ericsson	Se	16
26	Kvaerner	No	16
27	Stora	Se	15
28	Carlsberg	Dk	15
29	Norsk Hydro	No	15
30	Freia Marabou	No	53
31	VOLVO	Se	14
32	FLS Industrier	Dk	12
33	Superfos	Dk	12
34	Metra	Fi	11
35	SCA	Se	11
36	Dyno	No	9
37	Jens Villadsen	Dk	8
38	SKF	Se	7
39	Kone	Fi	6
40	Electrolux	Se	4