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LARGE CORPORATIONS IN THE FINNISH ECONOMY

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ABSTRACT: This paper is a part of larger research project on the role of the 30 largest firms in the Nordic countries. By examining the changes in the role of top 30 firms in the Finnish economy we aim to reveal some essential features of the structural transformation in the economy. From the national economy point of view these firms are in a crucial position. Almost all of them are multinationals, operate in several countries, and make influential decisions on trade and location of production. The analysis suggests that top 30 firms account for a substantial portion of business sector employment and value added in Finland. Moreover, the role of these large companies is particularly significant in foreign direct investment and in research and development. Our data however indicate that their role in the Finnish economy in terms of output and employment shares seems to have decreased during the recent decades. Yet, it is an open question to what extent large firms have reorganized their operations in such a way that they do not directly show up in their own output and employment data.

KEYWORDS: Multinational Firms, International Business, Structural Change.

JEL: F230 (Multinational Firms; International Business), L250 (Firm Performance: Size, Diversification, and Scope), O120 (Microeconomic Analyses of Economic Development).

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TIIVISTELMÄ: Tämä työpaperi on osa laajempaa Pohjoismaista tutkimushanketta, jossa tarkastellaan 30 suurimman yrityksen roolia kussakin Pohjoismaassa. Analysoimalla 30 suurimman yrityksen merkityksen muutoksia yrityssektorissa pyrimme kuvaamaan myös laajemmin yrityskentän rakenteessa tapahtuneita muutoksia. Kansantalouden kannalta nämä suuryritykset ovat tärkeitä toimijoita. Lähes kaikilla niistä on liiketoimintaa useissa maissa ja ne tekevät merkittäviä päätöksiä kansainväliseen kauppaan ja tuotannon maantieteelliseen sijoittumiseen liittyen. Tulostemme valossa 30 suurimmalla yrityksellä on huomattava osuus yrityssektorin työllisyydestä ja tuotannosta Suomessa. Samoin niiden osuus tutkimus- ja kehittämistoiminnasta ja kansainvälisestä liiketoiminnasta on suuri. Kyseisten yritysten osuus kotimaan tuotannosta ja työllisyydestä on kuitenkin pienentynyt viime vuosikymmenten aikana. Toisaalta toimintojen uudelleenjärjestelyt esimerkiksi ulkoistusten ja verkostoitumisen kautta hämärtävät kokonaiskuvaa.

AVAINSANAT: Monikansalliset yritykset, kansainvälinen liiketoiminta, rakennemuutos.

CONTENTS

1. INTRODUCTION

1.1. BACKGROUND

The 1980s saw a swift internationalization of large manufacturing firms in Finland. Compared to many other small industrial countries the stage of rapid internationalization started relatively late. The process was led by the largest manufacturing corporations of which many were still quite diversified at that time. Foreign expansion took place through mergers and acquisitions in the lines of business the companies were already operating. It was a matter of extensive growth abroad which in many cases benefited the home country operations through economies of scale.[1] Hence, the large industrial companies increased their role in the Finnish economy and especially as leaders in the booming outward foreign direct investment.[2]

The 1990s was quite different in many respects. FDI boom continued, and even accelerated, but large corporations adopted a much more focused strategy and specialized in their core businesses globally. Hence, there were a lot of divestment both in the home country and internationally, coinciding with large and more focused foreign acquisitions.[3] The 1990s saw also an increasing internationalization of service industries, notably retail trade and IT services. Many of the service firms, especially in the IT industry, represent SME sector rather than big business. Formation of European internal market and Finland's joining the EMU, and the subsequent removal of the currency risk in the European market, has further facilitated the internationalization process of SMEs in the new millennium.

Obviously, the role of largest firms both in domestic economy and in internationalization of business sector has changed during the past decades. It is likely, however, that the largest corporations still have a great importance in the economy, especially in the strategic areas like R&D and foreign activities.

1.2. AIMS OF THE STUDY

This study looks at the role of the largest corporations in the Finnish economy over the past 20 to 30 years. We are especially interested in how the significance of these heavy weights has changed as a consequence of the transformation of the international market environment and European integration. Another important factor that has obviously changed the firm dynamics among the group of the large companies as well as the position of these firms in the economy is information and communication technologies and networking of activities enabled by them. Large manufacturing firms have increasingly split their production processes or value chains into smaller pieces with different geographical locations. Off-shoring of stages of production is today possible without loosing the control of the production process –

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[1] See Mannio, Vaara & Ylä-Anttila (2003).

[2] Cf. Braunerhjelm, Heum & Ylä-Anttila (1996).

[3] Anecdotal evidence is given in Mannio et al. (2003).

thanks to modern ICT.[4] This has probably influenced strongly on firm size and organization, as well as governance and management practices. The core organizations might have become smaller but networks or international alliances bigger. Financial entity – legal firm that publishes financial statement – might be very different from the relevant organization consisting of formal (contract-based) or informal relations and networks.

The aim is, by examining the changes in the role of the large firms in the economy, to reveal some essential features of the structural transformation.

1.3. Data sources and construction of datasets

The important source of our firm-level data is a database based on the annual top 500 firms in Finland surveys carried out by Talouselämä magazine. This database includes financial data from 1986 onwards as well as some variables describing the international operations of firms. Unfortunately, data on international operations are available only since 1996. This restricts the time horizon of analysis to 1996-2006, as we want to divide employment, sales, and some other key variables to domestic and foreign components. However, we can link this dataset to the earlier constructed Nordic database on the internationalization of large firms which has been used, for instance, in the study of Braunerhjelm et al. (1996) and thus we are able to extend the time span of the study in some dimensions even to the 1970s. In addition, we are able to search any missing firm-level data from other financial databases available at the Research Institute of the Finnish Economy (ETLA).[5] Finally, at the late stages of the study we got access to the Orbis database managed by Bureau van Dijk Electronic Publishing (BvDEP). From this database we are able to search, for instance, the location of foreign subsidiaries of the firms analyzed in our study.

We construct two parallel datasets. Both datasets are based on the top 500 firms' list. The first one consists of the year-by-year listings of the 30 largest manufacturing firms measured by total employment (i.e. employment includes both employment in Finland and abroad). This dataset is equal to data used in the former Nordic database (Braunerhjelm et al., 1996). We merge these two datasets. The second dataset consists of the annual listings of the 30 largest firms in all fields, conditional to that every year there has to be at least ten firms from sectors other than manufacturing. This means that in this dataset there can be, in fact, more than 30 firms per year. However, only in 1996 (31 firms) the number of firms exceeds 30. We link both datasets to the nation-wide production, employment, and other relevant databases, which enables us to analyze the significance and changes of large firms' role in the economy.

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[4] Baldwin (2006) calls this "second unbundling" meaning the globalization takes place now at the level of different tasks or activities rather than at level of industries, sectors, firms, or skill groups.

[5] These sources include the Balance Consulting database which has financial information on several thousand firms from the years 1994-2004, and Suomen Asiakastieto Ltd. database which basically consists of all firms reporting publicly financial statements and covers the years 1999-2006.

2. DESCRIPTIVE ANALYSIS

2.1. STABILITY IN RANKINGS

There are in total 51 firms in the manufacturing dataset and 57 firms in the dataset including all sectors that have been among the top 30 firms in 1996-2006. As we can see from Figure 1, in both samples 14 firms have been among the top 30 firms every year. On the other hand, there are a number of firms that appear only a few times in the data. In order to study the stability of the composition of firms in the datasets we calculate the Spearman rank correlation coefficients. We rank the firms in terms of total employment. In addition, all firms not qualifying among the top 30 in a certain year are ranked as 31.

Figure 2 depicts the rank correlations for the two periods. The charts on the left show the correlation between the year 1996 and the subsequent years, and the charts on the right illustrate the correlation between the year 2000 and the subsequent years. The charts on the left indicate that the correlation weakens quite rapidly when we start the analysis from 1996. On the other hand, when starting from 2000 (the charts on the right), the rank correlation weakens notably less rapidly. This indicates that the late 1990s may have been a more turbulent period in terms of mergers and acquisitions, or other restructuring processes among the firms in the data than the early years of the new millennium.

To further analyze the stability of rankings, we plot the average rankings against the deviation of the rankings in Figure 3. The charts on the left include all firms ever appearing in datasets and the charts on the right only the 30 firms with the highest average ranking. The charts indicate that the larger firms in general tend to be somewhat stable in their rankings than the smaller ones. The top four firms, in particular, seem to be strong performers in terms of stability in their rankings.

Figure 1. Distribution of firms in terms of occurrences among the 30 largest firms.

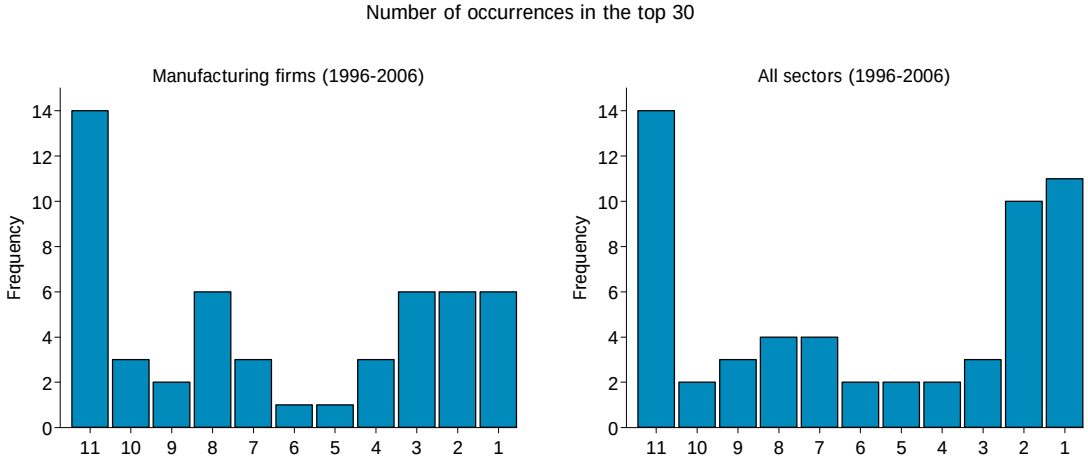
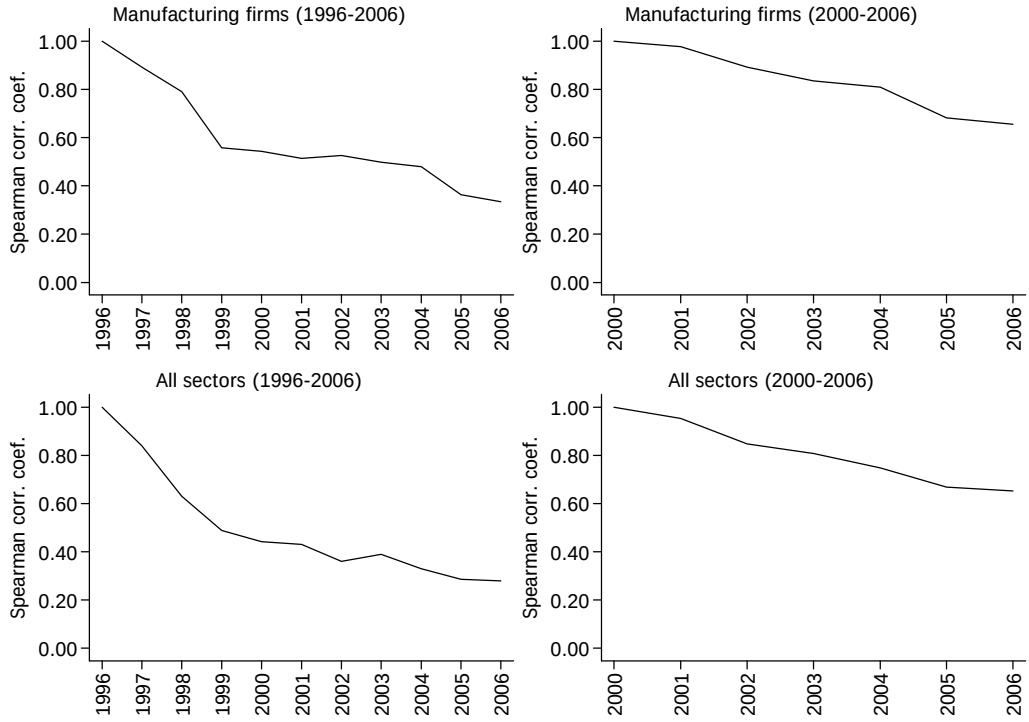
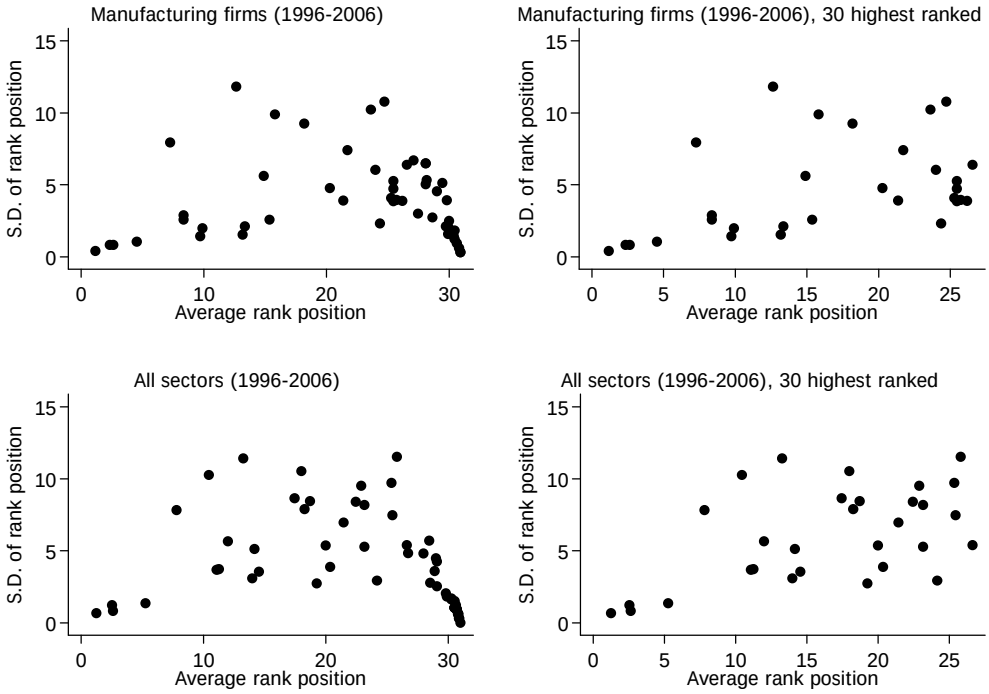


Figure 2. Rank stabilities for the firms in the datasets.



Notes: The charts depict the Spearman rank correlation coefficients between the first year of interest and the subsequent years.

Figure 3. Average rank position and stability in the rank position.



Notes: The charts on the left include all firms ever appearing in the data and the charts on the right only the 30 firms with the highest average rank.

2.2. THE ROLE OF THE 30 LARGEST FIRMS IN THE FINNISH ECONOMY

30 largest – Are they different?

Table 1 depicts some selected characteristics of the 30 largest firms in the latest year of observations (2006). As a reference group in the table we use other top 500 firms. We report the means and standard deviations of the selected variables in the both groups and the significance of the t-test which tests the equality of the means.

Quite naturally the 30 largest firms are in both panels significantly larger than other top 500 firms both in terms of total and foreign employment, and total and foreign sales. However, also the *ratios* of foreign to total employment and foreign to total sales are significantly higher in the 30 largest firms. In the manufacturing sample, 68% of the 30 largest firms' employees work abroad and the share of foreign sales is 72%. In the rest of the top 500 firms the shares are 17% and 12%, respectively. In the sample without industry restrictions, 52% of the 30 largest firms' employees work abroad and the share of foreign sales is also 52%. In the rest of the top 500 firms the shares are 14% and 9%, respectively.

In both samples, proxies for labor productivity[6] and R&D intensity[7] seem to have on average lower values in the group of top 30 firms than in the group of other large firms. In addition, in manufacturing financial strength measured by equity ratio is on average lower in the 30 largest firms compared to other large manufacturing firms. Further, in all sectors' sample, top 30 firms have on average lower profitability in terms of return on total assets. In this sample, the share of firms in trade sector is also lower among the top 30 firms than among the rest of top 500 firms. Appendix 2 illustrates that in 1996 the overall picture has been quite the same in terms of productivity, profitability, and financial strength.

As may be expected, the 30 largest firms are on average older than other firms. Although many mergers and acquisitions, and other restructuring processes potentially create difficulties to ex post study the history and define the age of firms, we have defined for all the firms in the 30 largest firm datasets in 2006 at least an approximation of the foundation year. In the manufacturing sample the mean of age in 2006 is 58 years and the median 62 years. In the sample including all sectors, the mean age in 2006 is 56 years and the median 55 years. We have unfortunately no comprehensive data on the age profile of all top 500 firms. However, we can compare the values to the whole firm population data in Finland: the mean age in the whole firm population in Finland was 12 years in 2006, and the median 10 years. These values are remarkably lower than the 30 largest firms' values.

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[6] The ratios of value added to employees and net sales to employees.

[7] The ratio of r&d expenditure to net sales.

Table 1. Some firm-level characteristics in 2006.

	Largest 30 firms		Other top 500 firms		T-test
	Mean	S.D.	Mean	S.D.	Signif.
Panel A. Manufacturing firms					
Total employment	14 036	13 872	933	1 059	***
Employees abroad	9 656	9 670	287	679	***
The share of foreign employees, %	68.3	26.4	17.1	25.0	***
Net sales, me	4 308	7 665	329	990	***
Foreign sales, me	3 596	7 637	83	377	**
The share of foreign sales, %	72.4	29.5	11.7	24.0	***
Industry (shares)					
Foods, textiles, apparel (15-19)	0.13	0.35	0.13	0.34	
Pulp and paper (20-21)	0.13	0.35	0.10	0.30	
Chemicals (23-25)	0.13	0.35	0.14	0.35	
Mech. engineering (27-29, 34-35)	0.27	0.45	0.29	0.46	
Electr. engineering (30-33)	0.17	0.38	0.10	0.30	
Other manufacturing (22, 26, 36-41)	0.17	0.38	0.25	0.43	
Net sales / empl. (mill. e)	0.3	0.2	1.0	3.7	***
Value added / empl. (1000 e)	66.3	39.1	139.1	465.5	*
R&D/Net sales, %	1.7	2.1	3.0	7.1	+
Return on total assets, %	10.3	7.0	12.0	12.2	
Equity ratio (Equity/Total assets), %	42.4	12.0	47.8	19.9	*
Panel B. All sectors					
Total employment	17 606	12 693	1 038	1 355	***
Employees abroad	9 834	9 855	299	880	***
The share of foreign employees, %	51.7	31.2	13.5	24.2	***
Net sales, me	5 063	7 577	379	838	***
Foreign sales, me	3 580	7 667	58	273	**
The share of foreign sales, %	51.5	36.9	8.9	21.7	***
Industry (shares)					
Foods, textiles, apparel (15-19)	0.03	0.18	0.06	0.23	
Pulp and paper (20-21)	0.10	0.31	0.04	0.19	
Chemicals (23-25)	0.07	0.25	0.06	0.24	
Mech. engineering (27-29, 34-35)	0.20	0.41	0.12	0.33	
Electr. engineering (30-33)	0.10	0.31	0.04	0.20	
Other manufacturing (22, 26, 36-41)	0.10	0.31	0.10	0.30	
Construction (45)	0.07	0.25	0.02	0.13	
Trade (50-52)	0.07	0.25	0.30	0.46	***
Transport (60-64, ex. 642)	0.10	0.31	0.04	0.19	
Telecom., software (642, 72)	0.03	0.18	0.03	0.16	
Other services	0.13	0.35	0.20	0.40	
Net sales / empl. (mill. e)	0.3	0.2	2.7	29.4	*
Value added / empl. (1000 e)	72.2	54.3	142.3	424.0	***
R&D/Net sales, %	1.8	2.2	2.9	6.6	'
Return on total assets, %	9.4	6.2	12.3	12.1	**
Equity ratio (Equity/Total assets), %	45.9	14.7	45.3	19.4	

Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, company reports, and author's estimates. NACE Rev. 1.1 industry codes are in the parenthesis. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10, + p<0.15, ' p<0.20.

Have largest firms been underperformers in terms of profitability?

Top 30 firms have been fairly profitable ones during 1996-2006. The median of the return on total assets (ROA) over the whole period has been in the manufacturing sample 8.1 percent (mean 8.9 percent) and in the all sectors' sample 8.0 percent (mean 8.5 percent). As Table 1 preliminarily indicated, the 30 largest firms however seem to be underperformers in terms of profitability compared to other large firms in the Finnish economy. Calculated over the whole period of 1996-2006, both the mean and median values of ROA are statistically significantly lower in the group of top 30 firms than in the group of the rest of the top 500 firms. To illustrate, Figure 4 depicts top 30 firms' profitability in 1996-2006; the reference group is other top 500 firms. As we can see, apart from the few years round the millennium, the 30 largest firms have performed on average less satisfactorily than other large firms. The differences in the performance are statistically significant at 10 percent level in 1996-1997, and 2003-2004 in the case of manufacturing, and in 1996-1998, and 2001-2005 in the case of all sectors.

It should be stressed that the results we have presented here are merely preliminary evidence because we have compared only unconditional means and medians of the two groups. In order to get more profound view we should control in more detail for example the industry and the size of firms. Furthermore, as we can see from Table 1, top 30 firms seem to be significantly more integrated into the global economy both in terms of foreign sales and foreign employment shares than other large firms in the economy. So, it is probable that 30 largest firms are more vulnerable with respect to turbulences in the global economy. The slowdown in the world economy during the early years of the new millennium, for instance, seem to have hurt more heavily the financial performance of the top 30 firms than the financial performance of other large firms.

Figure 4. Return on total assets in 1996-2006 (medians).

Notes: The data source is Talouselämä magazine's Top 500 firms' lists.

Do largest firms grow faster?

Table 2 depicts the average annual growth rates of top 30 versus other large firms in terms of production and employment in 1996-2006.[8] In both samples top 30 firms have grown during this period on average more rapidly both with respect to net sales and total employment than other top 500 firms. The differences are not however statistically significant due to large variance in growth rates among manufacturing firms and are only very weakly significant (at 20 percent level) with respect to employment in the sample including all sectors.

We have also divided the period into two sub-periods: 1996-2000 and 2000-2006. In both samples, top 30 firms have grown in the late 1990s in terms of net sales more rapidly than other large firms but the difference is not statistically significant even at 20 percent level due to large variance. In the latter period, there have been no significant differences in the average growth rates with regard to net sales. In terms of employment, on the other hand, weak statistical significances in the difference of the average growth rates can be found in the case of manufacturing firms in 2000-2006; during this period top 30 manufacturing firms have experienced more intense average growth rate compared to other large manufacturing firms. As we will see in the following analysis, the growth of top 30 firms has principally focused on foreign operations.

Observations in regard to growth fit fairly nicely with the overall description of industrial transformation – the late 1990s was a period when large firms were implementing their growth strategies through large and focused international mergers and acquisitions. The first years of the 21st century, again, saw a rapid growth of manufacturing off-shoring particularly to Asian countries which has been reflected as a relatively fast overall growth of the large manufacturing corporations.

[8] Top 30 firms refer here to firms belonging to top 30 ranking in 2006. As in the case of profitability analysis above, it should be stressed that this section is a preliminary descriptive study based on unconditional means.

Table 2. Growth of production and employment in the top 30 vs. other large firms.

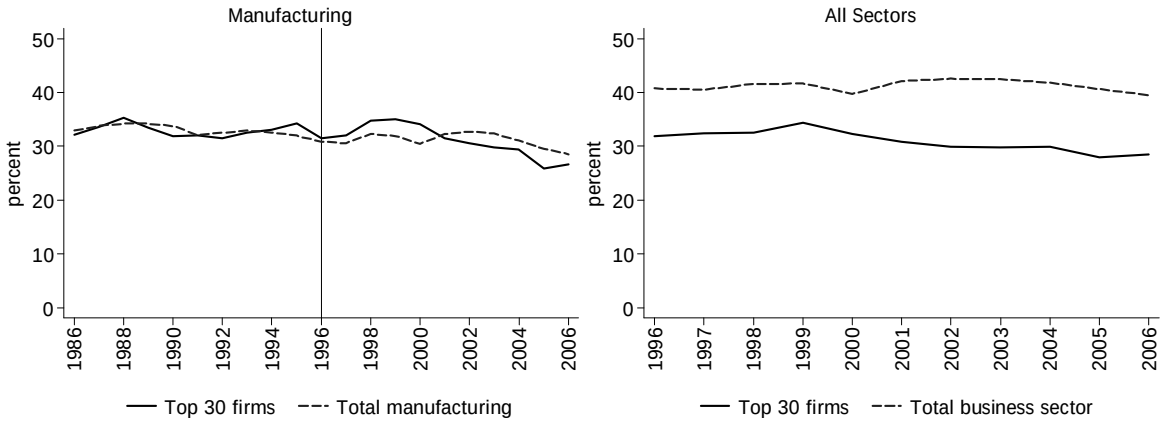
	Largest 30 firms		Other top 500 firms		T-test
	Mean	S.D.	Mean	S.D.	Signif.
Panel A. Manufacturing firms					
Growth of nominal net sales, % p.a.					
1996-2006	8.88	8.76	7.24	6.02	
1996-2000	15.84	20.76	10.07	12.04	
2000-2006	5.21	5.09	5.70	7.91	
Growth of total employment, % p.a.					
1996-2006	4.75	9.70	3.09	6.84	
1996-2000	7.24	14.83	7.52	15.87	
2000-2006	5.31	12.41	1.08	9.13	*
Panel B. All sectors					
Growth of nominal net sales, % p.a.					
1996-2006	9.93	8.91	7.58	5.66	
1996-2000	16.42	21.65	10.51	11.06	
2000-2006	5.42	6.68	6.62	8.14	
Growth of total employment, % p.a.					
1996-2006	5.82	7.34	3.61	6.95	'
1996-2000	8.69	13.59	6.08	13.37	
2000-2006	4.71	10.83	3.36	10.90	

Notes: The data source is Talouselämä magazine's Top 500 firms' lists. The largest 30 firms' group includes companies which were among the top 30 in 2006. Statistical significance: * p<0.10, ' p<0.20.

Specialization

The ratio of value added to value of output of firms in the industry can be seen as a crude measure of specialization: the decreasing ratio can be an indication that firms in the industry produce themselves less from the output and buy more intermediate products and services from other industries. Figure 5 illustrates this ratio among top 30 firms; as a reference group we use industry aggregates. In manufacturing, the ratio has been in both the top 30 firms' group and in total manufacturing in range of 31-35 % in the late 1980s and 1990s. Since the millennium the trend has been downward especially among the top 30 firms' group in which the ratio has decreased from 34 % in 2000 to 27 % in 2006. In the all sectors' sample, the trend of ratio of value added to output has also been downwards among the 30 largest firms in the early 21st century. The downward trend fits again quite nicely to the overall description of industrial transformation – the first years of the 21st century saw a growth of manufacturing outsourcing and off-shoring especially to Asian countries.

Figure 5. The ratio of value added to output.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide value added and output data); authors' calculations. In the all sectors' charts only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996. In the case of top 30 firms, the ratio has been calculated as the firms' total value added to their total net sales. In the cases of total manufacturing and total business sector, the ratios have been calculated from the annual national accounts as a ratio of value added to output of industries.

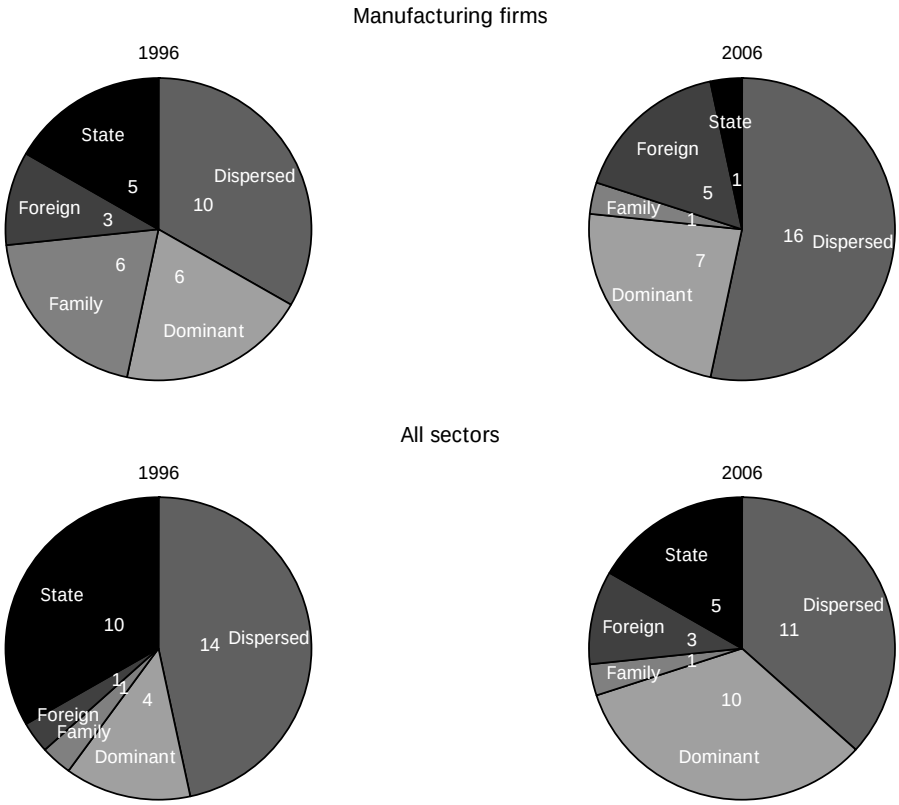
Major changes in ownership structure

Figure 6 illustrates the distribution of owner types in the top 30 firms in 1996 and 2006. We divide ownership into five categories. In the three categories, namely "family", "foreign"[9], and "state", there is a major owner that has over 50% ownership in the firm. The fourth category is called "dominant" which include those firms in which the ownership share of the largest owner is 20-50%. The fifth category, "dispersed", is for the firms in which the largest shareholder's stake is less than 20%. We can see from Figure 6 that in both samples and both years the largest owner type has been the dispersed one.

However, a long tradition of state-ownership in large companies is still clearly in sight in the first year of observation: there were five companies in the manufacturing sample and ten companies in the sample including also other sectors in which the state was the principal owner in 1996. The privatization of state-owned companies has decreased the number of the state-owned firms to one in manufacturing and to five in the all sectors' sample in 2006. In the manufacturing, it is also interesting to note that the number of family-owned firms has decreased from six to one. The sample including all sectors, the dominant ownership type has increased notably. Of the foreign-owned firms in manufacturing, two in 1996 and one in 2006 were subsidiaries of the Nordic group. In dataset including all sectors, in 1996 none and in 2006 two firms were subsidiaries of the Nordic group.

[9] "Foreign" refers to a foreign firm that owns over 50% of the target firm.

Figure 6. The distribution of owners among the 30 largest firms in 1996 and 2006.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, company reports, and authors' estimates. Ownership types are: Dispersed: the share of the largest owner is less than 20%; dominant: the share of the largest owner is 20-50%; State, family, and foreign: the ownership share of the state, family, or foreign firm is over 50%.

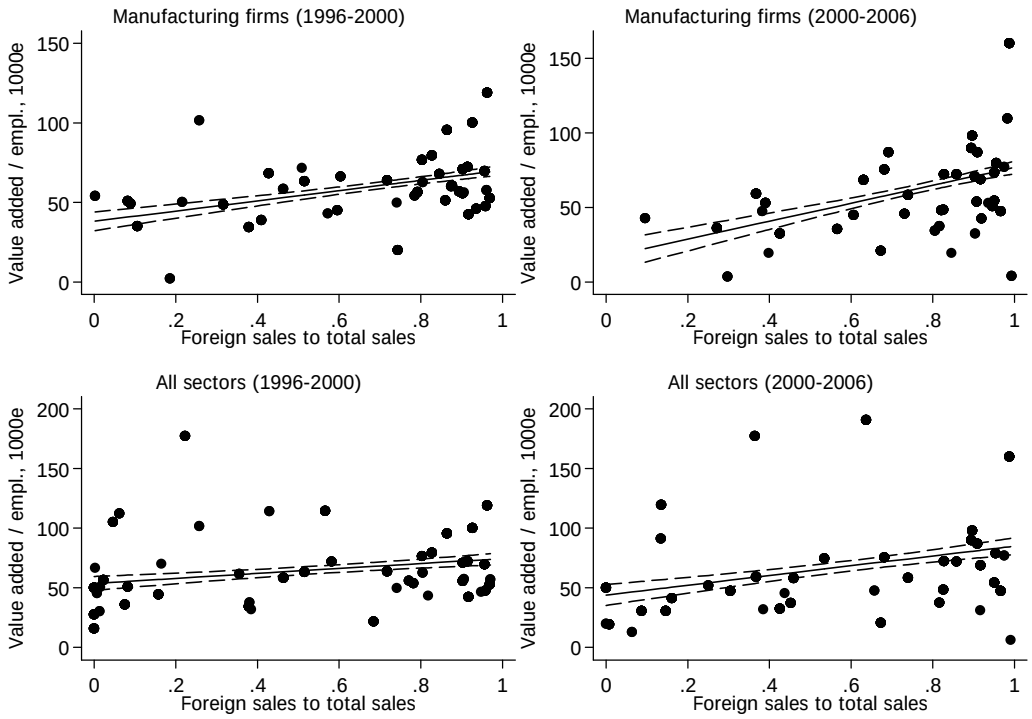
The firms with dispersed ownership structure are also the largest group of firms in terms of the number of employees in Finland among the 30 largest firms: their share of total number of employees in Finland among the top 30 firms was in manufacturing 45 percent in 1996 and 51 percent in 2006, and in the all sectors' sample 42 and 38 percent, respectively. The share of firms with dominant ownership structure was in manufacturing in 1996 15 percent and in 2006 as high as 30 percent. In the sample of all sectors, the shares were 9 and 25 percent, respectively. As the number of state-owned firms has diminished so has their share of employment: the proportion was in 1996 in the manufacturing sample 23 percent and in the sample including all sectors 44 percent. In 2006, the percentages were 2 and 22 percent, respectively. The same trend is visible in the case of family-owned firms, especially in manufacturing in which the employment proportion of family-owned firms has decreased from 9 percent in 1996 to 4 percent in 2006; in all sectors' sample the share has been around 2 percent in both years. Finally, the portion of foreign-owned firms of the 30 largest firms' total number of employees in Finland has increased in manufacturing from 9 percent in 1996 to 12 percent in 2006, and from 4 to 13 percent in all sectors' sample. In comparison, the share of foreign-owned firms of the total employment in the Finnish business sector was 8 percent in 1996 and 16 percent in 2006. These percentages suggest that the share of foreign-owned firms in terms of employment in Finland is still slightly lower among the top 30 firms than in the whole business sector. The trend has however been strongly upward during the recent decades; in 1975 there were no foreign-owned firms among the top 30 manufacturing firms, and

in 1990 there was only one accounting for about two percent of employment of the top 30 firms' total employment.

Does internationalization increase productivity?

In Figure 7 we have drawn scatter diagrams which depict the degree of internationalization (the average share of foreign sales to total sales) and the global labor productivity (the average value added per employee in 2000 euros) among the top 30 firms in the two sub-periods, 1996-2000, and 2000-2006. The charts indicate that there is a slightly stronger relationship between the degree of internationalization and labor productivity in the manufacturing data than in the data including all sectors. In addition, in both datasets the correlation is more evident during the latter period (2000-2006).

Figure 7. The degree of internationalization and global labor productivity.



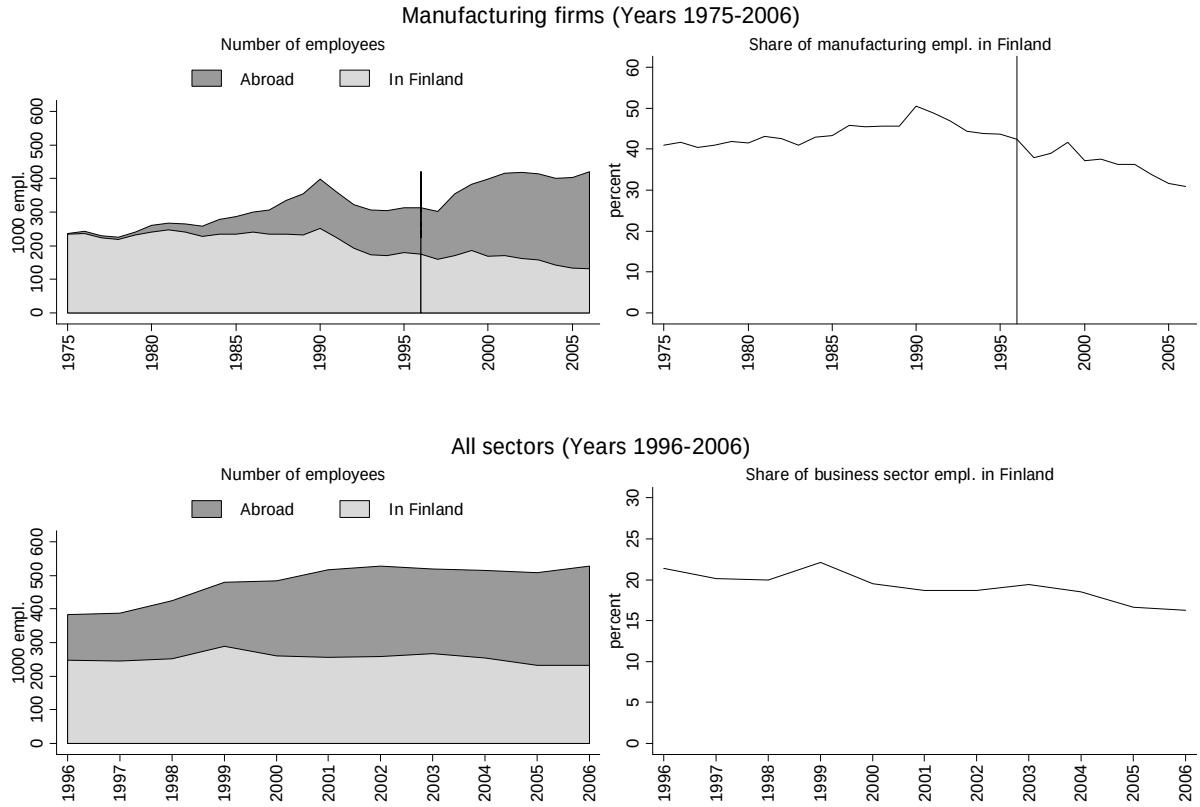
Notes: The data source is Talouselämä magazine's Top 500 firms' lists. The charts include regression lines (solid lines) with 95 percent confidence intervals (dashed lines) for the simple regression in which global labor productivity has been regressed by the degree of internationalization.

The top 30 firms' share of production and employment

Figure 8 illustrates the development of employment in the 30 largest firms and their share of employment in the economy. The internationalization of Finnish manufacturing firms started on a larger scale in the 1980s, intensified somewhat in the late 1980s, and again in the late 1990s. The number of employees in Finland in the 30 largest manufacturing firms has gradually decreased as well as their share of total manufacturing employment: their proportion of the employment in manufacturing was in the 1970s and 1980s about 40 %, peaked in 1990 at

48 %, and has decreased after the millennium towards 30 %. The lower part of Figure 8 indicates the same trend in the sample including all sectors: the share of the 30 largest firms of total business sector employment was in the 1990s above 20 % and decreased in the early 21st century below of that.

Figure 8. Development of employment in the 30 largest firms.



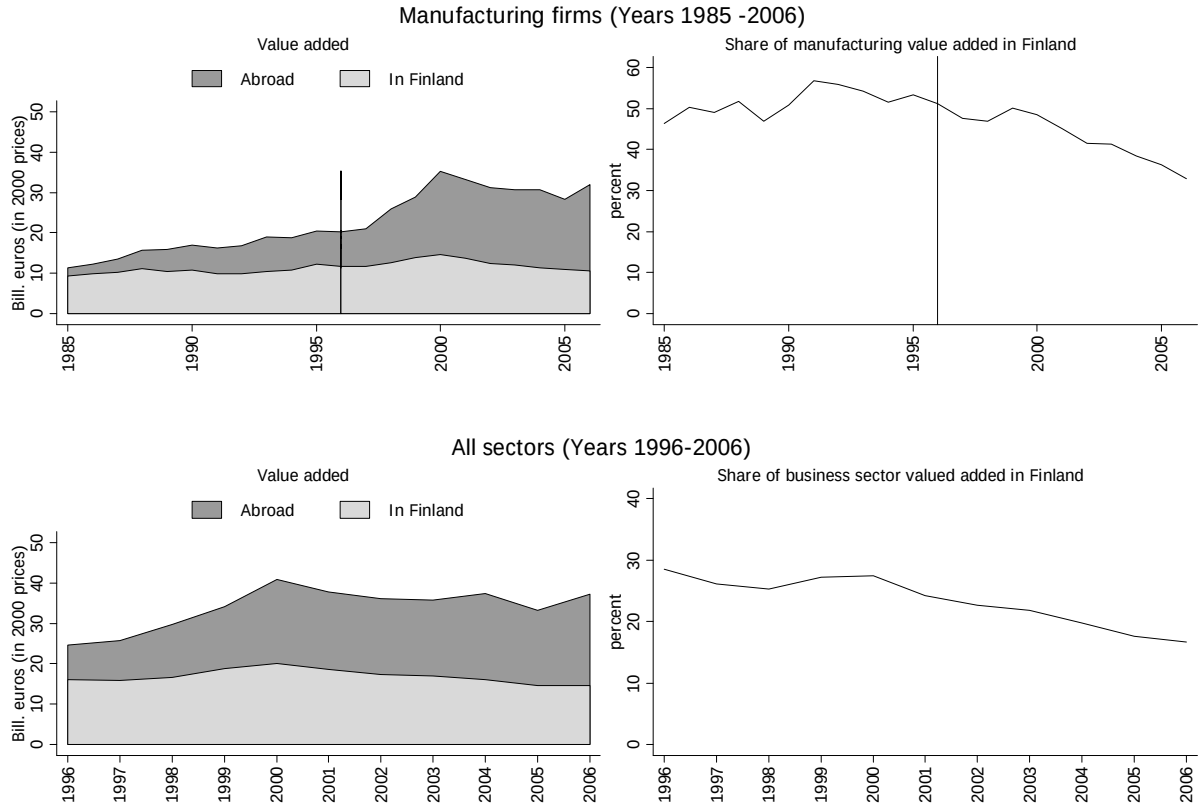
Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide employment data); authors' estimates. In the all sectors' charts only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996.

In Figure 9 we have drawn the development of value added of the 30 largest firms. There are two shortfalls in this figure compared to the employment analysis. First, we have regrettably no direct firm-level data on domestic and foreign components of value added. Instead, we use the domestic and foreign employment shares as an approximation for the firm-level shares of domestic and foreign value added. Although this proxy is quite far from the ideal one, it can be justified on the grounds that labor costs form the major component of value added in many industries. Second, the time span in the case of manufacturing firms is shorter (1985-2006) than in Figure 8 due to many missing value added values in the 1970s and early 1980s data.

We can see from Figure 9 that in the manufacturing sample the foreign component of the 30 largest firms' value added increased quite steadily in the 1980s and early 1990s. In the late 1990s value added from abroad soared both in the manufacturing and all sectors samples,

and after the millennium the growth of foreign value added slowed down in both samples. The share of the 30 largest firms of manufacturing production in Finland was in the 1980s and 1990s in the range of 45-50 percent. This proportion has decreased in the early 21st century to 35-40 percent. In the sample including all sectors, the share of the 30 largest firms of total business sector value added has fallen from nearly 30% in 1996 to clearly below 20% in 2006.

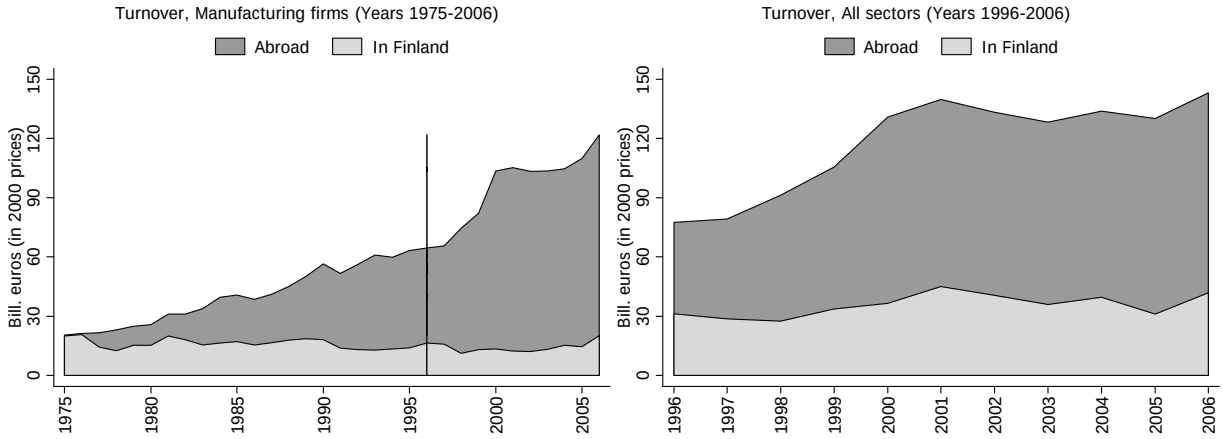
Figure 9. Development of value added in the 30 largest firms.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide production data); authors' estimates. Due to many missing values of value added in the 1970s and early 1980s data, the charts for manufacturing begin from 1985. Total value added has been divided into domestic and foreign shares by using the domestic and foreign employment shares. Value added has been deflated by GDP deflator (2000 = 100). In the all sectors' chart only 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996.

Figure 10 illustrates the development of domestic and foreign sales of the 30 largest firms. The charts indicate the same kind of trend as in the cases of employment and value added; the internationalization of the firms was rather virile in the 1980s and especially in the late 1990s, and after the millennium the growth rate of the internationalization slowed down. In addition, we can see from the figure a slight downward trend of sales to domestic markets in the manufacturing firms' sample. On the other hand, in the sample including all sectors the overall trend of sales to domestic market seems to be quite flat; the total annual domestic sales of the 30 largest firms have been around 30 million euros (in 2000 prices) during the years 1996-2006.

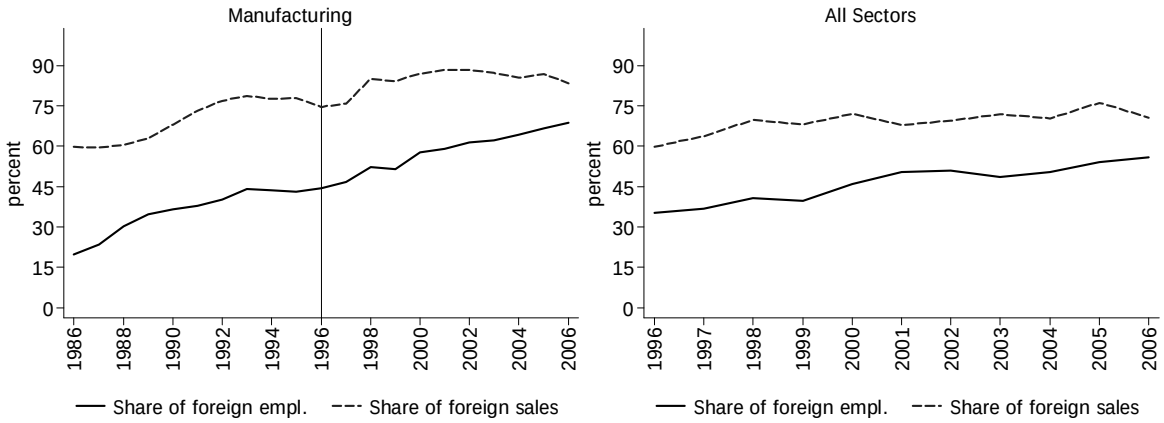
Figure 10. Development of net sales in the 30 largest firms.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, and the former Nordic database on large manufacturing firms; authors' estimates. Turnover values have been deflated by GDP deflator (2000 = 100). In the all sectors' chart only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' chart indicates the year 1996.

It is also interesting to compare side by side the development of the shares of foreign sales and foreign employees. Figure 11 illustrates these ratios in the case of top 30 firms. We can see that both in the manufacturing and all sectors' sample the proportion of foreign sales has been significantly larger than the proportion of foreign employees indicating that domestic production units have satisfied quite a large part of foreign demand. However, we can also see that the trend of the share of foreign employees has been especially in manufacturing strongly upwards over the studied period whereas the share of foreign sales increased only until the end of 1990s; since then the trend of the share of foreign sales has been rather flat. In the manufacturing sample, the ratio of these two shares was 3.0 in 1986, 1.7 in 1996 and 1.2 in 2006 meaning that, for instance, in 2006 the proportion of foreign sales was 20 % larger than the proportion of foreign employment. In the all sectors' sample the same ratio was 1.7 in 1996 and 1.3 in 2006. The convergence in the shares implies that the increasing portion of foreign demand has been satisfied in recent years by foreign production units. In addition, the barely steady percentage of foreign sales to total sales during the first years of the 21th century might suggest that at least temporarily a saturation point has been reached in the degree of internationalization of sales of the 30 largest firms.

Figure 11. The total share of foreign employees and foreign sales of the top 30 firms.



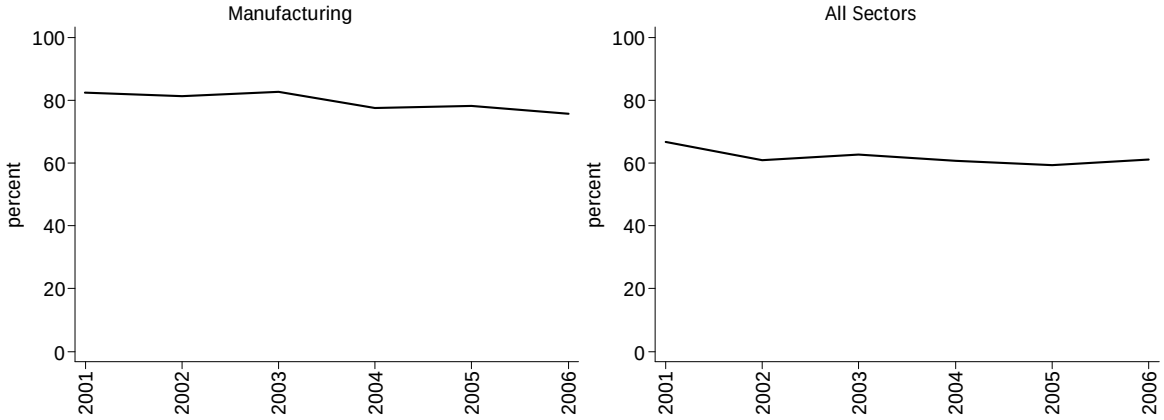
Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, and the former Nordic database on large manufacturing firms; authors' estimates. The lines depict the ratio of total number of foreign employees (foreign sales) to total number of all employees (net sales) of the top 30 firms. In the all sectors' chart only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' chart indicates the year 1996.

Above discussion implies that the significance of the 30 largest firms in the Finnish economy in terms of domestic employment and production has decreased during the recent years. They still, however, have a significant role in the economy, also in many other ways than with respect to domestic employment and production. As an example, we study in the following shortly their role in research and development activities in Finland.

R&D of top 30 firms in relation to business sector R&D

Largest firms have a dominant role in R&D activity in Finland. The share of 30 largest firms of R&D expenditure has however also decreased slightly in recent years both in manufacturing and in total business sector. As Figure 12 illustrates, the proportion of the top 30 firms in R&D carried out in Finland has gone down from above 82 % in 2001 to 76 % in 2006. In total business sector, the share has decreased from 66 % in 2001 to 61 % in 2006. Especially large manufacturing firms have increased in recent years R&D in foreign subsidiaries more rapidly than in domestic units which may partly explain the downward trend. It should be however emphasized that the top 30 firms' total nominal amount of R&D spending in Finland has increased also in recent years both in the manufacturing and all sectors' samples.

Figure 12. The estimate of top 30 firms' share of R&D carried out in manufacturing and in total business sector in Finland.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the Confederation of Finnish Industries (EK), Etla, and Statistics Finland (nation-wide R&D data); authors' estimations.

2.3. Location of foreign subsidiaries

The Orbis database managed by Bureau van Dijk Electronic Publishing enables us to estimate the geographical orientation of top 30 firms' foreign production and other activities. The Orbis database includes quite comprehensive information on location of subsidiaries but unfortunately other relevant data, such as industry classification and employment data, are available only for about 20 percent of subsidiaries in the case of our top 30 firms. The foreign affiliates with missing data are however likely to be smaller ones than the affiliates with non-missing data and thus we should be able to draw some general view of geographical orientation of foreign operations of top 30 firms with this database. In addition, we have access to data for the latest available year only and thus we are able to analyze no more than one cross-section.

Table 3 depicts the location of foreign subsidiaries and employment of top 30 firms in 2006. As we can see from the first columns of the table, in both samples the majority of affiliates are located in Western Europe and North America. Further, in the manufacturing sample the share of the Nordic countries is 12 percent, Eastern Asia 8 percent, and the Baltic countries 4 percent. In all sectors' sample the proportions are 21, 6, and 9 percent, respectively. The next columns of the table show that subsidiaries located in Western Europe and North America also employ the largest share of employees, about 45 percent in the manufacturing sample and 36 percent in all sectors' sample. In the manufacturing sample the proportion of employment of the Nordic countries is 21 percent, Baltic countries 11 percent, and Eastern Asia 10 percent. In the all sectors' sample the shares are 33, 11, and 8 percent, respectively. The last columns of the table report the total fraction of employees of the firms working in manufacturing firms in each region. It is worth noting that in the subsidiaries located in Western Europe and North America the total share of employees in manufacturing in remarkably lower that the corresponding share in the subsidiaries located in Eastern Asia. This is quite intuitive observation as we have seen that in recent years large Finnish firms (as well as their Finnish

subcontractors and other partners) have both off-shored in-house and outsourced quite heavily production in low-cost Asian countries.

According to official foreign direct investment statistics maintained by the Bank of Finland, Finnish firms employed abroad in 2006 totally nearly 382 000 employees. From these in the Nordic countries resided 22 percent, in other Western Europe and North America 40 percent, in the Baltic countries 8 percent, and in Eastern Asia 13 percent. These shares differ slightly from our data based on the Orbis database; the share of Eastern Asia, for instance, is in our data lower than in official foreign direct investment statistics. We are currently however unable to work out whether these discrepancies are due to missing data in the Orbis database, differences in data gathering processes, or real differences in geographical orientation between the largest 30 firms and other firms having foreign subsidiaries.

Table 3. Location of foreign subsidiaries and employment of top 30 firms in 2006.

Panel A. Manufacturing firms

	Number of firms		Number of employees*		Share of employees
	Sum	Share (%)	Sum	Share (%)	in manufacturing (%)*
Nordic countries	162	11.5	21932	20.8	75.3 [79]
Baltic countries	61	4.3	11571	11.0	71.6 [25]
Western Europe and North America	822	58.2	47538	45.0	64.2 [186]
Eastern Asia	117	8.3	10283	9.7	90.2 [16]
Other countries	251	17.8	14213	13.5	91.2 [34]
Total	1413	100.0	105537	100.0	

Panel B. All sectors

	Number of firms		Number of employees*		Share of employees
	Sum	Share (%)	Sum	Share (%)	in manufacturing (%)*
Nordic countries	308	20.8	40884	32.7	40.9 [120]
Baltic countries	138	9.3	14151	11.3	34.5 [44]
Western Europe and North America	710	47.9	44765	35.8	57.1 [152]
Eastern Asia	89	6.0	10118	8.1	90.5 [14]
Other countries	238	16.0	15295	12.2	89.3 [37]
Total	1483	100.0	125213	100.0	

Notes: The data source is Bureau van Dijk Electronic Publishing (BvDEP), ORBIS database. The employment and industry classification data have been available only for the largest subsidiaries. The last column in the table reports [in brackets] the number of subsidiaries for which employment and industry classification data have been available. Geographical regions are: Nordic countries (DK, IS, NO, SE), Baltic countries (EE, LT, LV), Western Europe and North America (AT, BE, CA, CH, CY, DE, ES, FR, GB, GR, IE, IT, LU, NL, PT, US), Eastern Asia (CN, HK, ID, IN, JP, KP, KR, LA, LK, MM, MY, NP, PH, PK, SG, TH, TW, VN), Other countries (rest of the world).

3. DISCUSSION AND CONCLUSIONS

The analysis above shows that a handful of large firms account for a substantial portion of business sector employment and value added in Finland. Moreover, the role of large companies is particularly significant in international activities – especially in foreign direct investment – and in research and development. In the group of the 30 largest firms more than 50 % of total employment is abroad, and among the 30 largest manufacturing firms the share is as much as close to 70 %. The share of the 30 largest corporations of total Finnish outward FDI stock (measured by foreign employment) is about 80 %. Their share of total business sector R&D expenditure is above 60 %. The 30 largest manufacturing companies, for their part, account for over 3/4 of total manufacturing sector R&D.[10] Furthermore, their role in internationalization – mainly outside European Union – has increased over the past years. From the national economy point of view these firms are in a crucial position. Almost all of them are multinationals, operate in several countries, and make influential decisions on trade and location of production.

Our results show relatively high stability in (size) rankings of the large firms. Especially the largest (top four) have kept their positions quite unchanged over the past ten years. There has, however, been interesting changes in the rank stability which coincide with the changes in the business environment of large firms. As a consequence of the deepening European integration and liberalizing the global economy in the 1990s, large firms increasingly focused into their core businesses. That led to restructuring in various forms – divestments, and mergers and acquisitions – which reflected as relatively big changes in rankings on the latter part of the decade. The first decade of the 21st century (since the peak of 2000) has been much less turbulent – the stage of intense restructuring was completed by the turn of millennium.

Among the 30 largest there can be found an indication of a positive association between the degree of internationalization and labor productivity. The relation between degree of internationalization and productivity level seems to have strengthened over time when the companies have become even more internationalized and exposed to global competition not only in product markets but also in the markets for production factors.

However, the largest corporations have not been performing better in terms of profitability or productivity compared to the total business sector or the top 500 companies which we used as a reference group. Our analysis shows that largest manufacturing companies have pursued primarily growth through internationalization and off-shoring. Top 30 manufacturing firms have grown slightly faster than other large manufacturing firms in the early 21st century when global outsourcing and off-shoring accelerated and big manufacturing companies obviously were forerunners in the process. It remains to be seen whether this internationalization process of recent years will show up as better than average profitability later.

As our data show the role of largest firms in international activities has increased until recently, but their role in the domestic economy – in terms of value added and employment shares seems to have diminished. Yet, it is an open question, to what extent large firms have

[10] In the Finnish case Nokia's role is decisive, it accounts for close to 50% of total business sector R&D in Finland.

reorganized their operations in such a way that they do not directly show up in their own output and employment data. There is a growing amount of evidence that off-shoring, networking, and strategic alliances have become essential part of larger firms' growth strategies.[11] Large firms nurture the emergence and growth of smaller firms in their supplier networks. Hence, their overall influence might be much larger than the direct employment shares are showing.

The ownership structure of the large corporations has considerably changed since the mid-1990s. The role of state as an owner has diminished, and foreign ownership, both in the form of direct and portfolio ownership has increased. In the group of large manufacturing companies, dispersed ownership has become the dominant type of ownership. Domestic banks, insurance companies, and other big domestic institutional owners gave up their stake as dominant owners as a consequence of financial market development during the 1990s. The financial system as a whole moved from a bank-based towards a market-based system where markets play a key role in allocating capital and controlling the management.[12] From the public policy point of view the financial development and changes in ownership structure mean that policies have much less direct influence. The role of state as an owner has dramatically decreased and possibility to affect industrial firms through monetary policies is insignificant compared to the early 1990s.

[11] See, e.g., Palmberg and Pajarinen (2005).

[12] For a comprehensive overview, see Hyytinen and Pajarinen (2003).

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Appendix 1. List of firms in 2006.

Panel A. Manufacturing firms

Rank	Firm name	Industry	Number of employees	Employees in Finland
1.	Nokia	Electr. engineering	65300	24067
2.	Stora Enso	Pulp and paper	45600	12848
3.	UPM-Kymmene	Pulp and paper	31000	16101
4.	Metsäliitto Osuuskunta	Pulp and paper	28800	9127
5.	Kone	Mech. engineering	28400	721
6.	Metso	Mech. engineering	23400	8847
7.	Elcoteq SE	Electr. engineering	16700	786
8.	SanomaWSOY	Printing and publishing	15700	6180
9.	Huhtamäki	Chemicals and plastics	14700	801
10.	Wärtsilä	Mech. engineering	13300	2677
11.	Karl Fazer	Foods	13100	5043
12.	Rautaruukki	Metals	13100	6954
13.	Kemira	Chemicals	9190	3154
14.	Outokumpu	Metals	8510	3034
15.	Cargotec	Mech. engineering	8030	1441
16.	Salcomp	Electr. engineering	7570	68
17.	Sanitec	Other manufacturing	7390	7390
18.	Perlos	Chemicals and plastics	7320	1660
19.	Konecranes	Mech. engineering	6860	1546
20.	Amer Sports	Other manufacturing	6790	397
21.	ABB	Electr. engineering	6290	6190
22.	Luvata International	Mech. engineering	6250	758
23.	Atria	Foods	5740	2325
24.	Ahlstrom	Pulp and paper	5690	776
25.	Consolis	Other manufacturing	5510	995
26.	HK-Scan	Foods	4420	2583
27.	Uponor	Chemicals and plastics	4260	478
28.	Valio	Foods	4170	3522
29.	PKC Group	Electr. engineering	4010	581
30.	Rapala VMC	Other manufacturing	3990	351
			421090	131401

Panel B. All sectors

Rank	Firm name	Industry	Number of employees	Employees in Finland
1.	Nokia	Electr. engineering	65300	24067
2.	Stora Enso	Pulp and paper	45600	12848
3.	UPM-Kymmene	Pulp and paper	31000	16101
4.	Metsäliitto Osuuskunta	Pulp and paper	28800	9127
5.	Kone	Mech. engineering	28400	721
6.	Itella	Post and transport	25300	23947
7.	Kesko	Trade	23800	14194
8.	Metso	Mech. engineering	23400	8847
9.	YIT-Yhtymä	Construction	21800	11309
10.	Elcoteq SE	Electr. engineering	16700	786
11.	SanomaWSOY	Printing and publishing	15700	6180
12.	Huhtamäki	Chemicals and plastics	14700	801
13.	TietoEnator	Software	14400	2175
14.	ISS Palvelut	Other services	14200	12628
15.	Wärtsilä	Mech. engineering	13300	2677
16.	Karl Fazer	Foods	13100	5043
17.	Rautaruukki	Metals	13100	6954
18.	VR-Yhtymä	Transport	12700	12700
19.	Sampo Konserni	Financial services	11700	5755
20.	Stockmann	Trade	10100	6879
21.	Nordea Pankki Suomi	Financial services	9840	9840
22.	Finnair	Transport	9600	8800
23.	Kemira	Chemicals	9190	3154
24.	Fortum	Energy	8910	3504
25.	Outokumpu	Metals	8510	3034
26.	Lemminkäinen	Construction	8420	6185
27.	Cargotec	Mech. engineering	8030	1441
28.	SOL Palvelut	Other services	7620	6009
29.	Salcomp	Electr. engineering	7570	68
30.	Sanitec	Other manufacturing	7390	7390
			528180	233164

Appendix 2. Some firm-level characteristics in 1996.

	Largest 30 firms		Other top 500 firms		T-test
	Mean	S.D.	Mean	S.D.	Signif.
Panel A. Manufacturing firms					
Total employment	10 444	9 197	576	714	***
Employees abroad	4 645	4 660	n/a	n/a	
The share of foreign employees, %	44.7	26.5	n/a	n/a	
Net sales, me	1 963	2 137	105	165	***
Foreign sales, me	1 464	1 702	n/a	n/a	
The share of foreign sales, %	69.3	26.7	n/a	n/a	
Industry (shares)					
Foods, textiles, apparel (15-19)	0.10	0.31	0.19	0.39	'
Pulp and paper (20-21)	0.17	0.38	0.07	0.26	
Chemicals (23-25)	0.17	0.38	0.09	0.29	
Mech. engineering (27-29, 34-35)	0.40	0.50	0.22	0.42	*
Electr. engineering (30-33)	0.07	0.25	0.11	0.31	
Other manufacturing (22, 26, 36-41)	0.10	0.31	0.32	0.47	***
Net sales / empl. (mill. e)	0.2	0.1	3.0	26.1	+
Value added / empl. (1000 e)	54.5	13.3	68.7	52.7	***
Return on total assets, %	9.2	4.4	11.5	9.3	**
Equity ratio (Equity/Total assets), %	41.4	12.1	45.7	19.0	+
Panel B. All sectors					
Total employment	12 792	9 336	628	874	***
Employees abroad	4 523	4 776	n/a	n/a	
The share of foreign employees, %	35.9	26.7	n/a	n/a	
Net sales, me	2 363	2 037	127	198	***
Foreign sales, me	1 413	1 737	n/a	n/a	
The share of foreign sales, %	55.0	35.3	n/a	n/a	
Industry (shares)					
Foods, textiles, apparel (15-19)	0.07	0.25	0.08	0.28	
Pulp and paper (20-21)	0.13	0.35	0.03	0.18	+
Chemicals (23-25)	0.17	0.38	0.04	0.19	*
Mech. engineering (27-29, 34-35)	0.23	0.43	0.11	0.31	+
Electr. engineering (30-33)	0.07	0.25	0.05	0.21	
Other manufacturing (22, 26, 36-41)	0.07	0.25	0.14	0.35	+
Construction (45)	0.03	0.18	0.02	0.15	
Trade (50-52)	0.10	0.31	0.32	0.47	***
Transport (60-64, ex. 642)	0.13	0.35	0.05	0.21	'
Telecom., software (642, 72)	0.00	0.00	0.04	0.20	***
Other services	0.00	0.00	0.12	0.33	***
Net sales / empl. (mill. e)	0.2	0.2	1.7	17.2	*
Value added / empl. (1000 e)	58.1	15.8	66.9	53.8	**
Return on total assets, %	8.5	4.0	11.2	9.0	***
Equity ratio (Equity/Total assets), %	42.6	14.3	40.4	20.0	

Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, company reports, and author's estimates. NACE Rev. 1.1 industry codes are in the parenthesis. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10, ' p<0.20.

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