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THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY
Lönnrotinkatu 4 B 00120 Helsinki Finland Tel. 609 900 Telefax 601 753
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Pontus Braunerhjelm* - Per Heum** - Pekka Ylä-Anttila***

INTERNATIONALIZATION OF INDUSTRIAL FIRMS

Implications for growth and industrial structure in the Nordic countries

* IUI - The Industrial Institute for Economic and Social Research - Stockholm
** SNF - Centre for Research in Economics and Business Administration - Bergen
*** ETLA - The Research Institute of the Finnish Economy - Helsinki

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ABSTRACT: The internationalization of Nordic industrial firms has been proceeding fast during the last 10 - 15 years. It has been dominated by the largest manufacturing firms, which are today highly internationalized compared internationally. According to several studies in the 1970s and 1980s the home country effects of the outward FDI on employment and firm performance were positive. The results presented in this study indicate, however, that this pattern may have changed in the latter part of the 1980s with regard to industrial production. Further research is required to document this change. It also needs to be emphasized that such change does not indicate that the Nordic countries would have been better off if the firms did not invest abroad, only that the relationship between outward FDI and home country activities might have changed.

KEY WORDS: Internationalization of business, FDI, industrial growth, knowledge-intensive firms, Nordic countries.

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TIIVISTELMÄ: Pohjoismaisten suurten teollisuusyritysten kansainvälistyminen on viimeisten 10 - 15 vuoden aikana ollut hyvin nopeaa ja niiden kansainvälistymisaste on kansainvälisestikin vertaillen korkea. Aiempien tutkimusten mukaan yritysten kansainvälistymisen vaikutukset kotimaan talouteen ovat olleet pääosin myönteisiä. Tämän tutkimuksen mukaan tilanne on mahdollisesti muuttunut 1980-luvun lopulla. Näiden muutosten selvittäminen edellyttää kuitenkin jatkotutkimusta. On syytä korostaa, että vaikka suorien sijoitusten vaikutukset kotimaan talouteen olisivat muuttuneet, ei näiden muutosten hyvinvointivaikutuksista voida sanoa mitään varmaa.

AVAINSANAT: Yritysten kansainvälistyminen, suorat sijoitukset, kasvu, teollinen rakenne, osaamisintensiiviset yritykset, Pohjoismaat.

CONTENTS

1. INTRODUCTION

A characteristic feature in the Nordic countries during the 1980s was the rapid internationalization of manufacturing production as manifested in unprecedented levels of outward foreign direct investment (FDI). Although this trend embraced most industrialized countries in that period, the negligible inflows of FDI distinguish the Nordic countries from the pattern observed in most other countries. These imbalances have raised concern about the effects on industrial structure and growth in the Nordic countries.

In this paper we examine the relationship between economic integration, internationalization of business and the development of small, open and industrialized economies. More precisely our purpose is threefold:

* to investigate empirically the driving forces behind the expanding international operations of Nordic firms;

* to elaborate on how the recorded internationalization among the firms affects industrial structure and growth in the home countries; and

* to discuss adequate policy responses to the current development.

Theory is far from providing a priori answers to the many effects that the internationalization of domestic firms may have on the home country's economy (Bellak, 1993). Most studies carried out on the Nordic scene have indicated mainly positive macroeconomic impacts (see Swedenborg et. al., 1988; Swedenborg, 1992; Kinnunen, 1993). The internationalization process has promoted the home country and its firms to reap the benefits of specialization. Foreign production seems to have complemented rather than substituted for domestic activities, generating positive effects to home country investments, export and productivity. However, these results, and the prerequisites for generalizing them, have recently been debated from a theoretical as well as empirical point of view (Svensson, 1993; Andersson,1994; Braunerhjelm-Oxelheim 1996).

The paper starts out by documenting the internationalization process among Nordic firms. The theoretical background on the location of foreign production, on which the hypotheses to be tested empirically rest, is briefly considered in section 3. This is followed by the empirical analysis (section 4), which combines firm-level data with more aggregated data on the country level. The focus is on Nordic countries compared to the OECD area, since this area has been the major recipient of Nordic

FDI. A separate section is devoted to the transition of the former command economies of East and Central Europe (section 5), since the motive to undertake FDI are likely to differ from those that foster FDI in the OECD area. We concentrate on Nordic foreign direct investments in the neighbouring Baltic states and Russia. Finally, in section 6 we wind up the paper by sketching some principle policy implications of internationalization in general and of the current situation in the Nordic countries in particular.

2 INTERNATIONALIZATION OF NORDIC FIRMS

To grasp the process underlying the industrial dynamics revealed by the extensive internationalization of Nordic firms, firm-level data are required. Our firm data are at the corporate level for the 30 largest manufacturing and mining firms (ranked by employment) from the four small, open economies of Denmark, Finland, Norway and Sweden, for the period 1975 - 1990/1993. These industrial firms hold a rather dominant position, particularly in Finland, Sweden and Norway, and the overwhelming bulk of outward Nordic FDI from the manufacturing and mining sector originates from these firms (Heum and Ylä-Anttila, 1993).

The Swedish firms are by far the largest, in absolute terms as well as compared to the size of the home country's economy. In 1990, employment in the 30 largest Swedish industrial firms was larger than total manufacturing and mining employment in Sweden (105 percent). The corresponding figures for the 30 largest industrial firms of Finland and of Norway, were also rather high: 80 percent and 60 percent, respectively. Denmark differs from the other Nordic countries in two ways. Firstly, a different industrial structure prevails, which is reflected in an employment share of the top 30 companies that equals slightly more than 30 percent of total Danish manufacturing employment. Secondly, Denmark is the only Nordic country that was a member of the European Community during the period we are studying.

Table 2.1 provides information on two aspects regarding the international operations of these firms. Foreign sales, measuring the share of the firms' turnover that is sold abroad, illustrate to what extent the firms' value creation is based on the servicing of international markets. Foreign employment, measuring the share of employment which is in subsidiaries located abroad, is a proxy for the extent to which the firms' value creation is based on production outside the home country.

It is evident that the largest Nordic industrial firms on the average are highly internationally oriented. In all the countries, the largest firms have more than 60 percent of their sales abroad; the Swedish have more than 80 percent. Furthermore, the largest manufacturing firms in Denmark, Finland and Norway have some 40 percent of their employment abroad, while the corresponding figure the largest Swedish firms is more than 60 percent.

Table 2.1 also illustrates how internationalization measured in terms of foreign sales and foreign

employment has increased quite substantially during the last two decades for the largest firms of all the Nordic countries. Most remarkable is the development of foreign employment among Finnish and Norwegian firms, a process that really gained momentum speed in the 1980s, and which is still going on. The largest Swedish firms, on the other hand, have operated as MNEs for decades. However, also these firms have become significantly more internationalized over the period.

Table 2.1 International Operations of the 30 Largest Industrial Firms, 1974-1993. (Foreign sales as a percent of firms' total turnover and foreign employment as a percent of firms' total employment.)

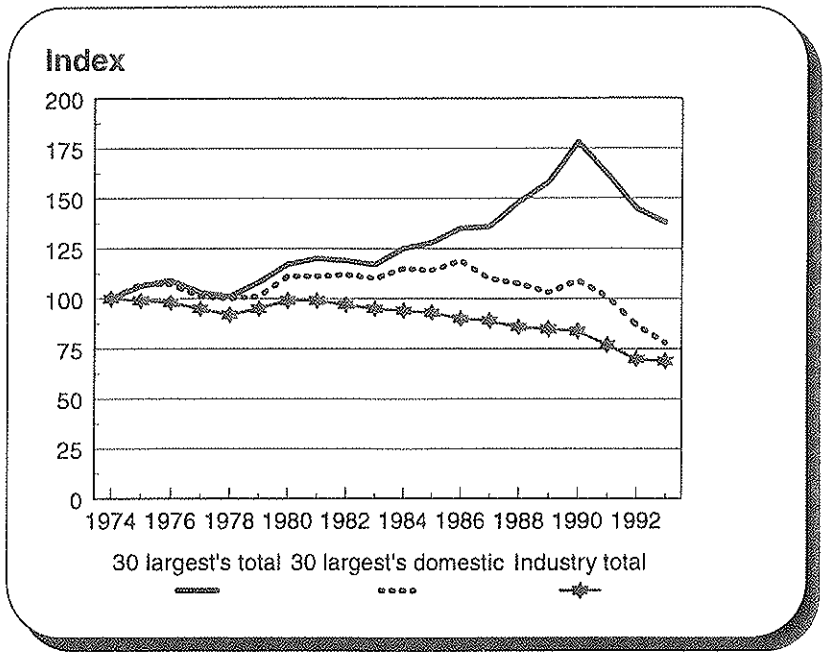
	1974	1980	1985	1990	1993
DENMARK					
Foreign sales				62	
Foreign employment				34	
FINLAND					
Foreign sales	41	50	56	69	71
Foreign employment	<10	<15	15	39	40
NORWAY					
Foreign sales	49	61	68	66	69
Foreign employment	6	9	21	33	38
SWEDEN					
Foreign sales	55	61	69	78	82
Foreign employment	37	42	43	62	62

Source: Large Firm Data Base of the Nordic Perspective Group

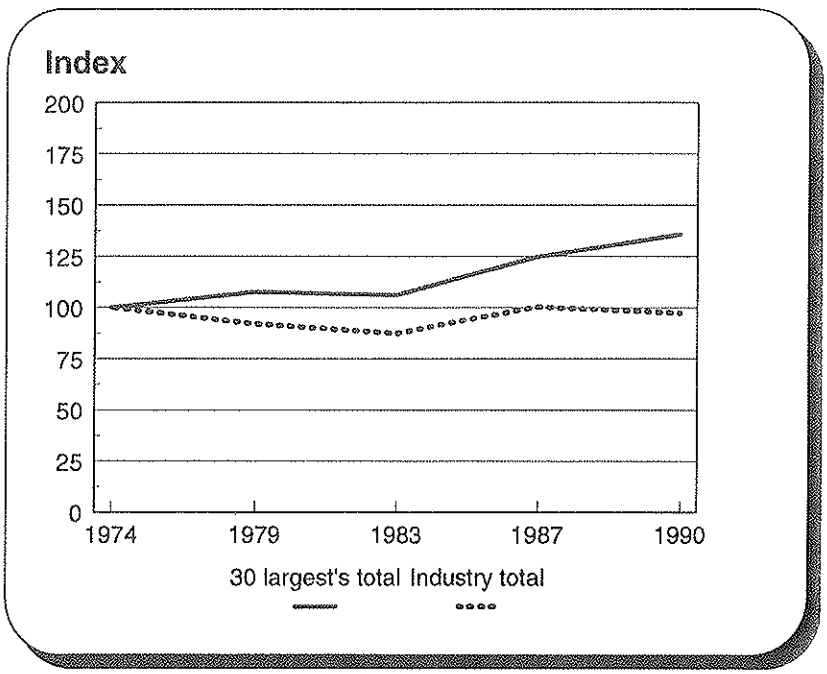
For all the countries it is evident that the magnitude of business operations conducted within these groups of the largest industrial firms have increased significantly compared to total manufacturing production in their home country. Figure 2.1 illustrates this by applying information on employment within the 30 largest firms of each country and relating it to total employment in the home country's manufacturing and mining. The relative increase in the business of the largest manufacturing firms is most notable in the case of Finland and Norway. Since the mid-1970s their employment has developed twice as strongly as employment in the manufacturing industry of the home country. For the largest Swedish firms this relative increase is about 60 percent, and for the Danish 40 percent.

Figure 2.1 World-wide and Domestic Employment of the 30 Largest Manufacturing Companies and Total Industrial Employment in Denmark, Finland, Norway and Sweden in 1974-1990/93.

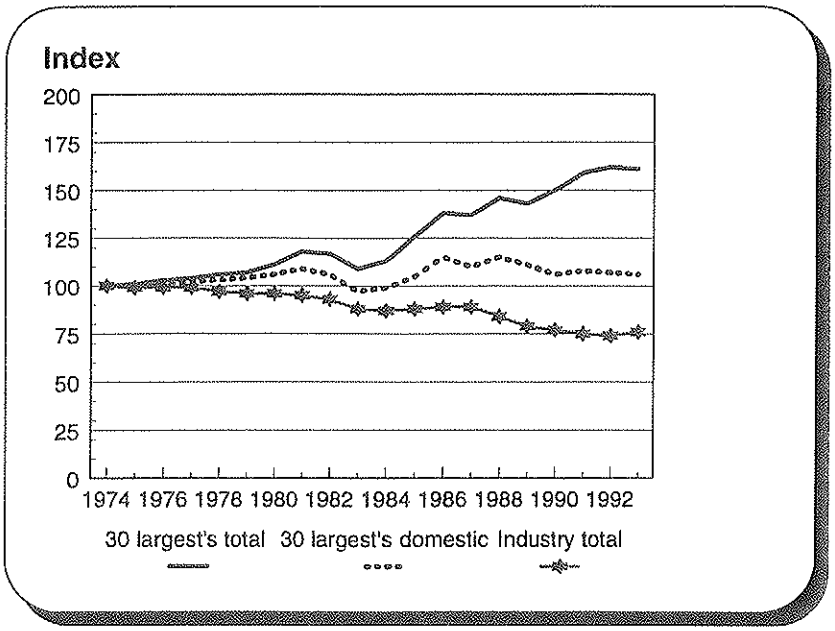
Finland



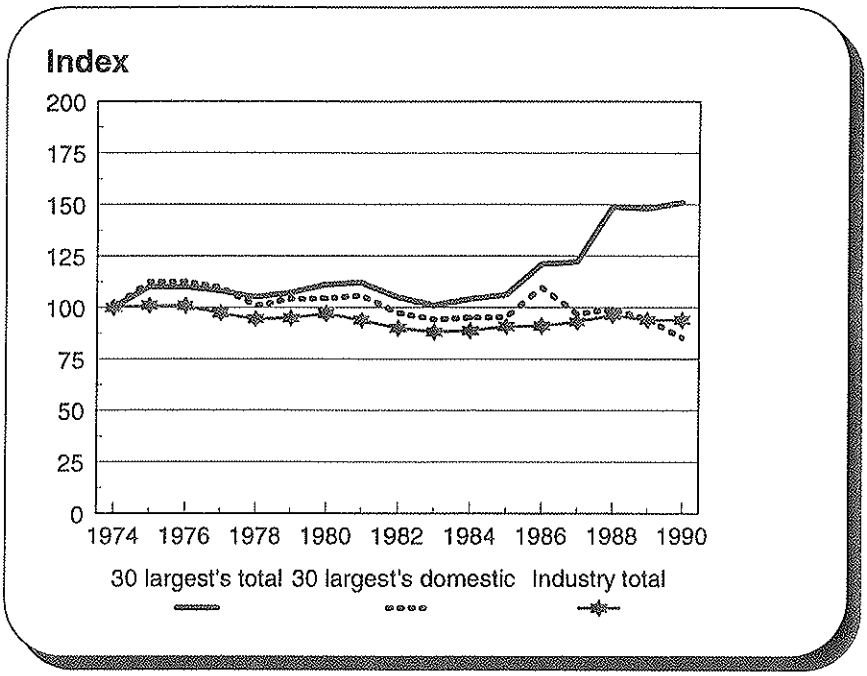
Denmark



Norway



Sweden



Source: The Large Firm Data Base of the Nordic Perspective Group and National Accounts

Domestic growth of the largest industrial firms has been clearly weaker than the increase of their world-wide activities, which is shown in Figure 2.1. Nevertheless, only Sweden has experienced a more rapid decline in domestic employment in its largest firms compared to total industrial employment in the home country.

The imbalance between inward and outward FDI is reported in Table 2.2 for 13 countries. A predominant feature in the Nordic countries is the growing imbalance between the stock of outward and inward FDI. This also holds for Denmark, the only member of the European Community during the period of investigation. In Sweden and Finland, this pattern of FDI flows has accumulated into a rather significant imbalance in the stocks of outward and inward FDI, which is only exceeded by Japan and Switzerland. Also in Norway a slight imbalance has developed at the national level, but because of the huge inward investments in Norway's oil, such imbalances are more prevalent at the sectoral level. For instance, according to Central Bank data, the stock of outward FDI by Norwegian manufacturing in 1993 was 4.5 times as high as the stock of inward FDI to this industry.

Table 2.2 Ratio of Outward FDI Stock to Inward FDI Stock in Selected Countries

	1980	1985	1990	1992
Denmark	0.29	0.5	0.8	0.97
Finland	1.36	1.38	2.36	2.32
Norway	0.35	0.97	1.27	1.45
Sweden	1.68	2.6	4.24	3.56
Austria	0.17	0.31	0.43	0.64
Belgium & Luxemburg	0.83	0.53	0.79	0.81
France	1.04	1.11	1.27	1.35
Germany	1.18	1.62	1.27	1.38
Netherlands	2.2	1.91	1.48	1.57
Spain	0.24	0.23	0.23	0.24
Switzerland	2.53	2.12	2.13	2.27
Japan	0.53	1.27	5.85	6.47
USA	2.65	1.36	1.09	1.17

Source: UN (1994) and Puhakka (1995)

Despite differences between the Nordic countries in the accumulated stock of outward FDI relative to the inward, they all seem to be exposed to industrial restructuring resulting from the larger

outflow than inflow flows of foreign direct investments[1]. Thus, even though the strength of these forces must vary between the countries concerned, they are all confronted with the question as to how the internationalization of domestic business affects macroeconomic development. Moreover, since the late 1980s their domestic business operations have developed no better or worse than average, as compared to the industry total of their home country. This illustrates that the comparative advantages of internationally operating firms and those of national economies do not necessarily coincide (Blomström & Lipsey 1989).

[1] The interrelation between FDI and domestic investment is crucial from the point of view of industrial growth. There is some evidence that in Sweden the FDIs by the basic industries have been complementing domestic investment, while the FDIs of technology-intensive industries have had a crowding out effect (see Braunerhjelm - Oxelheim, 1996).

3 THEORY ON THE LOCATION OF FDI

Our concern here is with the structural implications of FDI. One important question is then in which industries - knowledge or more basic oriented - FDI takes place, and whether any influence of such structural aspects can be connected with the rate of growth at the aggregate level. However, before turning to the empirical analysis, we will briefly recapitulate the building blocks of the theory of FDI. Foreign direct investment should not be confused with the transfer of capital and labor across countries. It is rather as if the increasingly global firms carefully choose where to locate or expand their production among competing host countries. FDI either takes the form of entry through greenfield investment or through acquisitions, where the latter form is dominating. Irrespective of the type of entry there is always one production factor transferred from the parent company to the foreign subsidiary: knowledge. Access to unique and firm-specific knowledge assets, or more precisely, to appropriate the return from such proprietary assets, also constitutes the theoretical rationale to undertake FDI. Alternative forms of internationalizing, i.e. through sales agents, licensing, etc., are less feasible since they involve a risk of firms being deprived of such assets.

The theoretical underpinning in this subfield of economics is still rather fragmented, compiling bits and pieces from different fields of economics to elucidate the locational pattern of firms. The microeconomic foundation of most theories of FDI rests on the theory of the firm (Coase 1937, Williamson 1975, 1979) and the theory of the firm's internationalization (Hymer 1960), i.e. transaction costs explanations are invoked. Such microeconomic explanations provide necessary conditions for FDI, but, they are not sufficient since firms always have the options to substitute FDI for exports from the home country[2].

The locational literature focuses on why firms tend to concentrate into certain geographically well-defined areas, even though costs are higher. The basic presumption is that firms are subject to increasing returns to scale, since otherwise all production could be replicated at each location. The economic geography literature claims that economies of scale and low trade costs make the location of production highly sensitive to differences in production costs, implying that firms will locate where demand is large. Since inflows of firms will further enlarge markets, this will make them even more

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[2] The most comprehensive framework with regard to FDI is the eclectic approach (Dunning 1977), i.e. the OLI-theory, which - rather than providing a full theory - discusses the necessary conditions for FDI to take place. The OLI-theory is named after the three main factors influencing FDI: ownership advantages, i.e. firm-specific assets are represented by O, while L stands for country-specific factors, and I refers to the internalization of firms' proprietary assets. Hence, it is a taxonomy of micro- and macroeconomic explanations of FDI.

attractive to other firms, such that centripetal forces tend to automatically reinforce each other. In addition to offering high levels of demand, large markets also have the advantage of supplying highly specialized and non-traded factors and services.[3] On the other hand, if the world is characterized by high trade costs and low economies of scale, production will be decentralized into several local markets. Furthermore, as emphasized by Krugman (1991a), the "pecuniary" links, i.e. externalities arising from market interactions, are at least as important as technological spillovers.[4] The analysis is frequently limited to the location of firms within countries although the same line of reasoning can of course be applied to the location of firms between countries. Another reason to locate in geographically concentrated areas is the possibility to capture spillovers from other firms or industries, which constitutes an important location determinant as suggested by the new growth theory (Romer 1986, Sala-i-Martin 1990).

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3 See Krugman (1991b) for a discussion of the significance of size in this respect.

4 If factor mobility is low, such agglomeration could be halted by increases in factor rewards.

4 NORDIC FOREIGN DIRECT INVESTMENT - STRUCTURE AND GROWTH IMPLICATIONS[5]

The two hypotheses to be tested are based on recent advances in economic theory. First, we will examine whether high-tech firms have a higher propensity to embark on foreign production and if that propensity has increased over time since dismantling of trade barriers has increasingly exposed firms to differences in production costs (section 4.1). We expect that this will be the case since high-tech firms derive economies of scale from firm-specific inputs (proprietary assets) which can be utilized by many plants irrespective of their location. In addition, spill-over effects are likely to be of more importance for high-tech firms. In basic-industry firms economies of scale predominantly occur on the plant level (cf. Braunerhjelm 1990). Second, based on the new growth theory, it is hypothesized that extensive outflows of FDI in the knowledge-intensive industry will have a negative growth effect on domestic manufacturing and GDP (section 4.2).

The empirical test will be based on the firm data set described in section 2, including the largest firms in the ISIC two and three categories, sometimes disaggregated to the three and four digit level[6]. Firms are ranked by the number of employees.[7] The database covers information on sales, exports, value-added, R&D, number of employees divided between foreign and domestic production, age and some other less frequently reported variables. Based on R&D intensities, firms are divided into technologically more advanced industries, referred to as high-tech, basic industries, and a third group denoted "other", containing firms that could neither be classified as basic nor high-tech.[8]

All countries have firms that doubtlessly fall into the high-tech industry category. Among these are firms in the pharmaceutical, transport, instrument and electronic industries, to mention a few. There are also firms involved in typical basic-industry production, although here the differences among the Nordic countries are more distinct. Finland, as well as Sweden, has a large forest and mining sector. In Norway, energy-intensive metal production and the extraction of oil are the dominant basic industries.

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5 The results presented in this section draw heavily on a previous study by Braunerhjelm (1994).

6 With the exception of Danish firms, for which data is only available for a few years.

7 In each year (1975-1990) the 30 largest firms are included, i.e. the data set is an unbalanced panel. For the earlier years, data are not always available, implying that the regressions are based on a somewhat lower number of firms.

8 It is only in the case of Norway and Sweden where it was possible to use R&D spending as a "high-tech" indicator, and for Sweden only for 1978, 1986 and 1990. According to these intensities firms are categorized in each country for each year, including Finland. High-tech industries consist of the following ISIC classes: 351, 352, and 380-385. Basic industries are the following: 210, 220, 310, 311, 331, 340, 341, 370-372. The rest of the manufacturing industries are classified as "Other." Firms are assumed to be homogenous within the three sub-industries, i.e. in order to save degrees of freedom firm-specific dummies have not been implemented.

4.1 Structure and determinants of Nordic FDI

The first empirical model focuses on the determinants of the FDI by firms in the Nordic countries.[9] To capture structural effects of outward FDI dummies are assigned to firms in order to classify them in the categories mentioned above. The basic industry constitutes the reference group. The high-tech firms are expected to be positively connected with FDI, while it is more difficult to a priori assign any value to the industry denoted "other", representing quite heterogeneous production.

Time dummy variables are used to examine the effects of the creation of the internal market within the EU on FDI. It is hypothesized that Nordic firms, facing a situation in the late 1980s of being outsiders to the European integration process combined with political ambivalence concerning the future association with the Community, stepped up their investments in the EU. The time period 1975-1990 has therefore been divided into three segments, each containing five years. The reference period is 1975-1980. The dummy variable T80 takes on a value of one in the period 1980-1985, while T86 is the equivalent dummy for the period 1986-1990. These dummies are expected to capture a positive and increasing effect on the foreign production of Nordic firms over time[10].

Two variables reflecting the effect of differences in growth and production costs between foreign and domestic markets, i.e. whether FDI is market- or factor-driven, are also included. First, the difference between a three-year moving average in GDP growth between the OECD countries and each Nordic country is calculated (DIFGDP). A higher foreign growth is hypothesized to have a positive effect on location abroad (market-driven). Second, the differences in unit labor costs calculated as two-year moving averages in the OECD-area and the Nordic countries respectively, have also been constructed (DIFULC). The shorter time period is based on the assumption that firms can redirect production quite quickly between their foreign and domestic units if production costs differ. Higher foreign unit-labor costs should have a dampening effect on production abroad (factor-driven).[12]

During the last 20 years, barriers to trade and FDI between the Nordic countries and other

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9 The Nordic countries are here defined as Finland, Norway and Sweden.

10 The White Paper and the Single Act, the two most important documents to realize the internal market, were approved in 1985 and 1986, respectively.

12 In previous studies on country factors that attracts FDI the most frequently used variables are size of the market, openness and geographical proximity (Kravis-Lipsey 1982, Culem 1988, Veugelers 1992, Brainard 1993). The data are collected from OECD statistics, various issues.

European countries have been radically reduced. The increased exposure of differences in production costs has been incorporated through two interaction dummies. They consist of the multiplicative effect of the time periods referred to above and differences in unit-labor costs for each of the Nordic countries and the rest of the world, defined as the OECD area. These variables are denoted TC80 and TC86, and we expect both to be positively related to the firms expansion abroad. Again, the effect in the latter period is expected to be more pronounced due to the accelerated regional deregulation taking place within Europe, being the Nordic firms' most important markets in the 1980s.

Finally, as data availability varies between countries, so does the independent variables utilized in the regressions for the respective Nordic country. Based on earlier research in this area referred to above, the following control variables are also included in the empirical analysis and contained in the variable Z: value added, exports, size, R&D, age and profits. Thus, the general structure of the model is the following,

$$FEMPit = B_0 + B_1HIT_{it} + B_2OTHER_{it} + B_3T80_{it} + B_4T86_{it} + B_5TC80_{it} + B_6TC86_{it} + B_7DFGNP_{it} + B_8DIFULC_{it} + B_9Z_{it} + u_{it}$$

where the endogenous variable $FEMP_{it}$ refers to the firm i's share of foreign employees at the time period (t). Finally, u is the error term assumed to have zero expected mean and to be non-correlated, i.e. $u_{it} \sim (0,\sigma^2)$ and $E(u_i u_j) = 0$. Note that $E(u_{it}u_{jt})=0$, for $i \neq j$ while $E(u_{is}u_{is}) \neq 0$ for $s \neq t$. However, this will not yield inconsistent parameter estimates.

The results of the OLS-regressions are shown in Table 4.1. All variables are in logarithms and those referring to values have been deflated by the consumer price index for the respective country . To avoid heteroscedasticity and to correct for firm size, the variables are expressed in units per employee.

Starting with Sweden and Finland, the results in Table 4.1 show that most variables are significant and have the expected sign. The explanatory variables in addition to the ones described above, i.e. those summarized in variable Z, are the following. First, scale effects, i.e. the size of firms, have in several other studies (e.g. Swedenborg 1979) been confirmed as significant for a firm's foreign operations, and here it is measured as the numbers of employees (size). Recent findings have also established a negative relationship between foreign production and exports from the domestic units in

the 1980s (Braunerhjelm 1993, Svensson 1993). Exports are consequently expected to be negatively connected with the share of foreign employment. Profits, defined as operating profits divided by total sales, are also included as an explanatory variable since it reflects some kind of firm-specific asset , which according to economic theory has a positive influence on internationalization (Hymer 1960, Dunning 1977). Since profit data for Norway were not available when running the regressions, value added per employee , i.e. labor productivity (VA) was used instead.

A strong positive relationship between high-tech firms and foreign production is established, as compared to basic industry firms in all the three countries: Sweden, Finland and Norway. In addition, the time variable capturing FDI after the decision to establish the internal market (1985-1990) within the EU, is highly significant. Confirming previous results (Braunerhjelm 1993), exports and foreign production display a negative relationship. Size only attains the expected positive impact on foreign production in the case of Finland while the opposite prevails with regard to profits, i.e. it is positively correlated with foreign production for Sweden but not for Finland.

Higher growth abroad, i.e. an expansion of the market, and lower foreign production costs display the expected positive impact on foreign production for Sweden, but not for Finland. As shown by the interaction dummies, TC80 and TC86, differences in production costs have increasingly influenced the location of production during the whole 1980s for Sweden. In the case of Finland, the interaction variable is only significant in the period 1986-1990. It reflects the decision to establish the internal market within the EU and, for the same reason, that Finnish firms became more exposed to international competition simultaneously as their export markets in the former Soviet Union began to collapse.

Finally, the results of the Norwegian data are shown in Table 4.1. Labor productivity is replacing the profit variable while R&D data are exclusively available for Norway. The R&D variable, being a proxy for firm-specific assets, is lagged by three periods. Previous studies confer a positive relationship between R&D and foreign production (Horst 1972, Caves 1971, Magee 1977, Teece 1983).
A severe restriction is the lack of data on exports by Norwegian firms. Instead, we have to use foreign sales, which naturally are expected to be positively connected to foreign employment. In the beginning of the period foreign sales match exports very closely, making it an acceptable proxy for exports, while in the late 1980s the discrepancy between the two becomes wider. The ages of firms are also included for Norway.

The picture that emerges is less clear-cut than for the two other countries and thus much harder to interpret. The dummies for the different sub-industries are significant and the high-tech dummy has the expected positive sign. Likewise, the time dummies have the expected sign and are highly significant while, somewhat surprising, only the interaction dummy for the period 1980-1985 is significant. Foreign sales are, not surprisingly, significantly related to the firms' operations abroad, as is higher GDP growth in the OECD area. On the other hand, size is negatively connected with the internationalization of Norwegian firms, which could be explained by the large corporations in the Norwegian oil industry and in other basic industries. The highly negative significance of labor productivity on foreign production may seem more of a surprise, which is probably due to extremely high values of value added per employee in the R&D. Age and differences between production costs in Norway and OECD fail to show any significance. Overall the explanatory power is substantially lower than to the results for Sweden and Finland.

Table 4.1 OLS estimation of the share of foreign production in large industrial Nordic firms, 1975-1990

Explanatory variables	Sweden	Finland	Norway
Intercept	.34*** (4.70)	-.70*** (-6.35)	.28*** (3.56)
High-tech	.10*** (7.24)	.06*** (2.84)	.10*** (7.16)
Other	-.05** (-2.53)	-.06** (-1.98)	.14*** (8.99)
T80	.08*** (4.81)	.05 (1.24)	.05** (2.34)
T86	.10*** (2.89)	.15*** (4.77)	.13*** (5.72)
TC80	.009** (2.03)	.01 (1.18)	.03*** (2.89)
TC86	0.013** (2.38)	.02*** (4.77)	.003 (.92)
Size	-.003 (-.47)	.09*** (7.16)	-.03*** (-3.42)
Exports	-1.26*** (-14.74)	-.1.04*** (-6.52)	
Foreign sales			.63*** (11.95)
Profit	1.11*** (4.51)	.37 (.79)	
VA			-.66*** (-10.70)
Age			-0.01 (-1.27)
R&D(-3)			.34 (.73)
DIFBNP	.007** (1.97)	-.003 (-.63)	.009** (2.39)
DIFULC	-.006*** (-3.84)	-.002 (-.66)	-.002 (-1.03)
Adjusted R2	0.61	0.52	0.45
F-value	60.35	20.16	22.31
DF	409	220	320

Note: * = 10 percent significance, ** = 5 percent significance level, *** = 1 percent significance level

4.2 Growth implications of FDI

The second hypothesis concerns the effect of outflows of investments by high-tech firms on the rate of growth of the manufacturing production and GDP. According to the endogenous growth literature, the

rate of growth varies with the level of the knowledge stock. Knowledge accumulation is a central activity in multinational corporations and as was shown in the previous section, knowledge-intensive MNCs have been relatively more engaged in FDI than other firms. If the outflow of knowledge-intensive investments is not compensated by inflowing FDI or by increased indigenous investments in the knowledge intensive sector, this suggests a relative depreciation of the knowledge stock in the respective Nordic country. Based on the new growth theory we would expect that to be mirrored in lower growth rates.[13] To our knowledge there has not been any attempts to incorporate such structural implications of FDI on growth rates.

In Table 2.2 the large imbalances between outflows and inflows of foreign direct investment were shown, i.e. we can conclude that there has been no off-setting inward flows of foreign direct investments. What about indigenous investment? For the Swedish manufacturing sector Braunerhjelm-Oxelheim (1996) have argued, using industry data, that a substitutionary relationship prevails between domestic and foreign investment in more technologically advanced industries, while a complementary investment pattern exists in the basic industry.

Our starting point will be to estimate the interrelations between FDI and growth of manufacturing production in the Nordic countries. Thereafter we will consider links between FDI and GDP in an analogous way.[14] The time period under consideration is the same as above, 1975 -1990. Growth in manufacturing is defined as the yearly change in manufacturing output in real terms, while the GDP growth is measured as described in section 4.1, i.e. as the differences in the real rate of growth between the OECD average and the respective Nordic country. This latter variable is chosen for the following reasons: The fact that the major part of global FDI takes place among the OECD countries implies that we quite safely can conclude that the knowledge stock - and rate of growth - in the OECD area is likely to be unaffected by FDI from the Nordic countries.

The other variables implemented in the correlation analyses are the following: First, two interaction variables (denoted FE81 and FE86), denoting the share of foreign employment in the knowledge-intensive industry in 1980-1985 and 1986-1990 are constructed. We expect those to be negatively connected to the growth variables. In addition, the differences in unit labor costs, as described in section 4.2, are implemented and we believe higher unit labor costs (DIFULC) to be associated with

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13 In a study based on the locational pattern of Swedish multinationals, knowledge-intensive firms have been shown to locate in areas already abundant in knowledge production (Braunerhjelm-Svensson 1995). These results suggest that the structure of FDI may influence growth rates across countries.

14 The additional statistics used here is collected from the Annual Nordic Statistic Yearbook, various issues.

slower growth in manufacturing production and GDP in the Nordic countries. Finally, domestic industrial investments are included, which of course are assumed to be positively related to expanding manufacturing output. The rationale behind introducing this variable is that increased FDI may have been occured in tandem with increased indigenous investment in the Nordic area. In that case, FDI would have little influence on manufacturing production and on overall growth as well. In the GDP correlations we have substituted domestic manufacturing investment (since we expect that variable to be highly correlated with manufacturing production, which is included) for the annual change in R&D expenditures in the manufacturing sector (RINV). All variables are expressed as annual rates of changes, they are deflated, and no lag-structure are imposed[15].

The correlations between these variables are given in table 4.2a and 4.2b[16]. In the first table only Norway reports negative correlation between FDI by the "high-tech" sector and manufacturing production in the entire period 1980-1990 (FE81 and FE86). For Finland and Sweden, however, the former positive sign becomes negative in the subsequent period 1985-1990 (FE86). This suggest that something happened in that period which affected the relation between home-country production and firms' overseas production, still, in no case was significance attained.

The strongest relation reported in table 4.2a occurred between domestic investments and manufacturing growth. In Finland and Sweden this relation was significant on the 5 percent level. For Norway no such significance could be found, although the effect was positive. Differences in unit labor costs also appeared with the expected negative sign for all three countries, yet the relation seems to be statistically robust only for Finland.

Looking at the full correlation matrix (see the appendix), a positive correlation between the unit labor cost variable and domestic investment emerges in all Nordic countries in 1980-1985 (significant on the 1 percent level in Sweden and almost significant on the 10 percent level in Norway). Thus, the intuitive interpretation is that a relative increase in domestic unit labor costs boosts foreign investments, i.e. firms opened up new ventures abroad or expanded production in existing foreign affiliates. This relation did, however, shift for Sweden and Norway in the latter part of the 1980s, probably influenced by a booming economy, at least in the case of Sweden. Another common feature among the Nordic

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15 Thus we are implicitly assuming that the knowledge stock, and growth rates, are only influenced by production by high-tech firms, overall investments in manufacturing and R&D expenditures, which of course is highly unrealistic. Education, infrastructure, etc, also influence growth.

16 The complete correlation matrices are given in the appendix.

countries is the negative correlation between FDI in the two periods (FE81 and FE86), which is likely to reflect the massive outflows of FDI in the latter period.

Table 4.2a Correlation coefficients between manufacturing production (IND), investments (INV), differences in unit labor costs (DIFULC), and FDI (FE81, FE86) by "high-tech" firms in the Nordic countries

	FINLAND	NORWAY	SWEDEN
INV	0.52**	0.35	0.69**
DIFULC	-0.70***	-0.26	-0.33
FE81	0.09	-0.21	0.05
FE86	-0.08	-0.2	-0.11

Note: * = 10 percent significance, ** = 5 percent significance level, *** = 1 percent significance level

Turning to Table 4.2b, less guidance is given concerning the effects of the share of foreign production by high-tech firms on the relation between Nordic growth of GDP as compared to the OECD average. This is not unexpected, considering the high level of aggregation and the limited time-period. In Finland, a positive relation in the first half of the 1980s switched into a negative in 1985-1990. In Norway an opposite pattern emerged (significant for the period 1985-90), while it remains negative for Sweden during the whole period, although it is only significant in 1980-85.

A more distinct relation is obtained between GDP growth and manufacturing production (IND). In all three countries a positive correlation emerged, which is clearly significant for Finland and Sweden. Similarly, significant negative connection is established between differences in higher unit labor costs and GDP growth for all Nordic countries, but it is only significant for Finland and Sweden. Finally, as expected, increased expenditures on R&D in the manufacturing sector (RINV) and GDP growth correlate positively with the 10 percent significance level in the case of Norway.

The relationships among the other variables are illustrated in the appendices A4-A6. Again a negative connection appear between indigenous manufacturing production and unit labor costs differences, while a negative correlation is found between foreign investments in the two periods. Also the remaining correlations conform with those reported in Table 4.2a. With regard to the added variable, RINV, it can be noted that it is negatively related to relatively higher unit labor costs in the Nordic countries as compared to an OECD average, and significantly so in Finland (on the 10 percent level). In addition, a positive relation between R&D expenditures (RINV) and FDI by the high-tech sector is

found for the period 1985-1990 for all three countries. In Finland and Norway it switched from a negative to a positive correlation as compared to the first part of 1980s. A suggestive interpretation is that R&D-intensive manufacturing firms enjoy economies of scale in their increased operations, or, put differently, foreign operations are necessary in order to cover the costs incurred in domestic R&D activities.

Table 4.2b Correlation coefficients between differences in GDP growth (GROWTH), change in manufacturing R&D (RINV), manufacturing production (IND), differences in unit labor costs (DIFULC), and FDI (FE81, FE86) by "high-tech" firms in the Nordic countries

	FINLAND	NORWAY	SWEDEN
RINV	0.3	0.44*	0.16
IND	0,69***	0.33	0.57**
DIFULC	-.57**	-0.37	-.70***
FE81	0.04	-0.4	-0.48*
FE86	-0.12	0.43*	-0.06

Note: * = 10 percent significance, ** = 5 percent significance level, *** = 1 percent significance level

To sum up, the statistical analysis gives some support for the hypothesis that there is a negative connection between FDI by technologically advanced firms and manufacturing production in the Nordic countries. The correlation analyses indicate that a former positive relation between home country manufacturing production and FDI was replaced by a negative impact in the latter half of the 1980s. With regard to foreign production by "high-tech" firms and the relative rate of GDP growth in the Nordic countries as compared to the OECD area, a rather blurred picture emerge. Only in the case of Finland is there a shift from a positive impact between FDI and GDP growth in the first part of the 1980s to negative influence in the period 1985-1990. In Norway an opposite pattern emerges, while Sweden has experienced a negative correlation over the whole period.

We would like to stress that the time period in the above analysis is far too short to allow conclusions concerning the relationship between growth and FDI. We would expect the effect of a diminishing industrial knowledge stock to show up in aggregate growth rates with a considerable lag. Hence, in order to make any firmer conclusions the statistical analysis must be extended considerably. It should also be emphasized that the (preliminary) results obtained so far do not lend themselves to interpretations implying that capital controls and restrictions should be implemented of restored.

Rather, if firms did not have the opportunity to go abroad, the negative connection established here would probably only have reached an even higher magnitude.

5 NORDIC MNEs AND TRANSITION ECONOMIES : PATTERNS AND PROSPECTS OF FDIs IN THE BALTICS AND RUSSIA[17]

The elaboration of driving forces and impacts regarding Nordic FDIs has so far focused on industrialized countries. The transition of Central and East European economies, however, has created other opportunities due to the extremely low cost level and the possibility of an immense future market growth in these countries. This means that other forces than those already pinpointed, may be at work with possibly a different set of influences on the micro-, as well as the macro-level in the Nordic economies.

So far we know little about the foreign business operations of Nordic firms in Eastern Europe. The data on Nordic FDIs in this region are incomplete, but on the basis of the estimates of the central banks and some recent studies, the tendency seems clear.[18] The Nordic firms, notably Finnish and Swedish, have rapidly increased their direct investments in the nearby regions, i.e., in the Baltic countries and the St. Petersburg area. The volume of FDI is, however, very small. In the case of Finland the share of overall Eastern Europe in the total FDI stock is about 3 - 4 %.

In terms of the number of foreign subsidiaries the significance of the Baltic states and Russia has been increasing rapidly in all the Nordic countries with the exception of Norway (see Table 5.1) . The total number of registered foreign subsidiaries of Finnish companies in Estonia alone in 1995 was about 6000, i.e., approximately one third of all the Finnish owned foreign subsidiaries. However, only half of the Estonian located subsidiaries are in operation. In other Baltic countries and Russia the share of operational subsidiaries is even lower. Furthermore, less than five per cent of all the Finnish foreign affiliates in the Baltics and north-west region of the Russian Federation are production units. Evidently, these figures describe relatively well the situation of other Nordic countries too (cf. Borsos 1995).

Most of the Nordic FDI projects are so far in trade, services, transportation and telecommunications. The share of manufacturing is low, contrary to Nordic FDIs in Western countries. The low share and small average size of manufacturing FDI projects reflects the cautiousness of investors due to political and economic instability.

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17 This section is based on Borsos and Erkkilä (1995a and 1995b) and Borsos (1995).

18 See especially Borsos (1995) and Borsos and Erkkilä (1995a)

Table 5.1 Number of registered foreign-owned firms in the Soviet Union (end-1989), the Russian Federation (mid-1993) and Estonia (end-1993) by country.

	Soviet Union end-1989		Russian Federation mid-1993		Estonia end-1993
Finland	28	USA	1433	Finland	3365
Austria	26	Germany	1141	Russia	850
West Germany	26	UK	557	Sweden	730
Italy	14	Italy	511	Germany	231
USA	13	Austria	475	USA	203
Switzerland	10	Poland	438	Ukraine	75
UK	9	Finland	429	Denmark	62
Total					
-registered	191	-registered	9125	-registered	6316
-operating	na	-operating	6488	-operating	2502
[I.] PlanEconReport 24.3.1989, Volume V, p.14.					
[II.] Jakovleva, Kuzmin					
[III.] Finland's Trade Center in Tallinn					

Source: Laurila, 1994

Table 5.2 Major foreign investor countries in the Baltic states and St. Petersburg

Host country	Home Country	Number of companies Share (%)	Investments Share (%)
Estonia	**Sweden**	11	28
(Jan. 1, 1995)	**Finland**	52	22
	Russia	13	12
	USA	4	7
	Germany	4	4
Latvia	**Denmark**	n/a	31
(July 31, 1994)	**Russia**	26	n/a
	USA	8	18
	Germany	12	9
	Sweden	7	4
Lithuania	**Great Britain**	2	22
(Oct. 31, 1994)	**Germany**	17	18
	USA	6	11
	Russia	24	6
	Poland	15	5
St.Petersburg	**USA**	15	26
(Jan. 1, 1994)	**Germany**	14	18
	Finland	14	5
	Sweden	5	4
	UK	4	4

Source: Borsos and Erkkilä (1995b)

The FDIs in the manufacturing sector seem to concentrate in a few industries - foodstuffs, textile, clothing and building materials - indicating the factor cost driven nature of investments. This is not, however, according to Borsos (1995) the only - or not even the dominating - motive of Nordic firms to invest in the Baltics and the Russian Federation. Many of the firms are market seekers, or they invest in support services which complement their home country activities. A general motive seems to be to get a foothold in the market in the anticipation of future take-off of these economies, and partly to buy out potential competitors.

The motives for FDIs in Eastern Europe has been studied in more detail for some 20 Finnish companies with investments in the Baltics and St.Petersburg (Borsos, 1995). Applying the classification of strategic motives of FDIs by Behrman (1981), the motives of firms are divided into four main categories: 1) Market seekers, 2) Raw material seekers (factor cost motive), 3) Production efficiency seekers (factor cost motive), and 4) Knowledge seekers.

Using this classification the FDIs of the case companies and their impacts on domestic employment and growth can be grouped in three categories:

1. *FDIs with positive growth and employment effects in Finland, increasing the demand for high-skill labor.* This group contains market seekers, efficiency seekers and firms investing in support services in electronics, software, banking and investment goods.
2. *FDIs with a neutral or slightly positive effect on domestic growth and employment,* containing market seekers, firms investing in trade and distribution channels in foodstuffs, building materials and metal industries.
3. *FDIs outsourcing labor-intensive products, with negative effects in the short run on the demand for low-skill labor and growth in certain industries.* These are efficiency seekers (efficiency pursued by investing in production where certain factors are underpriced relative to their productivities) in textile and clothing, manufacture of furniture, and other labor intensive industries.

The overall impacts of the case companies' FDIs on total Finnish employment can be regarded as slightly positive or neutral. Rather than affecting the level of demand for labor in Finland, these FDIs have, however, affected the structure of the demand. The demand for skilled labor has increased, while that for unskilled labor has decreased. Hence, the main effect of the FDIs in East Europe seems to have been an acceleration of the ongoing structural change in Finnish industry. In addition, the case analyses give clear evidence that firms which previously invested in Western low cost countries (like Portugal) or in developing countries, have now redirected their investments in nearby former socialist economies.

In the future these trends are likely to be augmented, when the trade and entry barriers are further lowered, provided that the political and economic instability decreases. This inevitably means increasing relocation of basic, low-skill industrial activities to these low-cost areas. The specialization of the Nordic countries in knowledge intensive products will become increasingly stronger leading to decreasing demand for low skilled labor and, obviously, a widening of wage differentials.

6. CONCLUSIONS AND POLICY IMPLICATIONS

The internationalization process of the Nordic countries has been proceeding fast during the last 10-15 years. It has been dominated by the largest manufacturing firms, which are today highly internationalized compared internationally. The 30 largest Danish, Finnish, and Norwegian firms have some 40 per cent of their employment abroad. The corresponding figure for Sweden is about 60 per cent. Together with the imbalances between inward and outward FDI - the Norwegian oil industry being an exception - this distinguish the Nordic countries from most other industrialized countries. During the 1980s and early 1990s these imbalances were even more pronounced. Moreover, the knowledge intensive firms have been increasing their foreign production faster than basic industry firms. Altogether this means that the small Nordic economies have become quite sensitive to the strategies of MNEs.

According to several studies in the 1970s and the 1980s, the home country effects of outward FDI on employment and firm performance were positive. The results presented in this study indicate, however, that this pattern may have changed in the latter part of the 1980s with regard to industrial production. This supports the results of other recent studies that have concluded that the former complementary relationship between FDI and home country exports and investments has vanished. Instead the statistical analysis indicates a negative, substitutionary effect of FDI by technologically advanced firms on domestic industrial production while the growth effects were more ambiguous. Further research is required to document this change. It also needs to be emphasized that such change does not indicate that the Nordic countries would have been better off if the firms did not invest abroad, only that the relationship between such investment and home country activities has changed.

FDIs by Nordic firms to nearby former socialist economies (the Baltic states and the Russian Federation) have increased rapidly in the 1990s. The employment and growth effects on the domestic economies seem to have been quite small so far. The main effect of the FDIs in East Europe has been an acceleration of the already ongoing structural change in the Nordic economies. It is likely that this development is further reinforced in the low-skill, low-tech industries in the near future leading to decreasing employment in these industries.

Inspite of the concern that growth effects on the domestic economy are being altered by the recent increase in outward FDIs by high-tech firms and FDIs in the East Europe are accelerating employment reduction in certain industries, new capital controls are no policy alternative for the Nordic countries.

More important is the dynamic effects of integration on economic growth, which would be dampened if such controls were enforced. Instead policy efforts should attempt to promote the strength and competitiveness of the domestic industrial base to attract internationally competitive footloose firms, whether they are of domestic or foreign origin. This implies that the policy emphasis is moving more and more from product markets to factor markets.

The main task of industrial policies of small advanced countries is to ensure that the elements determining competitiveness create a favorable environment toward areas with positive externalities, above all education, technical and social infrastructure, and R&D. The policy goal should not be the reallocation of current resources but rather the influencing of quantity and quality of resources for the future.

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APPENDIX

A1. Correlation between manufacturing production, investments, unit labor costs and FDI by "high-tech" firms, Finland 1975-1990

	IND	INV	DIFULC	FE81	FE86
IND	1	0.52**	-0.70***	0.08	-0.08
INV	0.52**	1	-0.28	-0.1	0.03
DIFULC	-0.70***	-0.28	1	0.31	0.07
FE81	0.08	-0.1	0.31	1	-0.08
FE86	-0.08	0.03	0.07	-0.08	1

A2. Correlation between industrial production, investments, unit-labor costs and FDI by "high-tech" firms, Norway 1975-1990

	IND	INV	DIFULC	FE81	FE86
IND	1	0.34	-0.26	-0.2	-0.2
INV	0.34	1	0.17	0.01	-0.01
DIFULC	-0.26	0.17	1	0.39	-0.15
FE81	-0.2	0.01	0.39	1	-.51**
FE86	-0.2	-0.01	-0.15	-0.51**	1

A3. Correlation between industrial production, investments, unit-labor costs and FDI by "high-tech" firms, Sweden 1975-1990

	IND	INV	DIFULC	FE81	FE86
IND	1	0.69***	-0.33	0.05	-0.11
INV	0.69***	1	-0.23	-0.06	-0.24
DIFULC	-0.33	-0.23	1	0.69***	-0.08
FE81	0.05	-0.06	.69***	1	-0.26
FE86	-0.11	-0.24	-0.08	-0.26	1

A4. Correlation coefficients between differences in GDP growth (GROWTH), manufacturing production (IND), change in manufacturing R&D (RINV), differences in unit labor costs (DIFULC), and FDI (FE81, FE86) by "high-tech" firms in the Nordic countries, Finland 1975-1990

	GROWTH	RINV	DIFULC	FE81	FE86	IND
GROWTH	1	0.29	-0.57**	0.4	-0.13	0.69***
RINV	0.3	1	-0.45*	-0.02	0.58*	0.51*
DIFULC	-0.57**	-0.45	1	0.31	0.07	-0.70***
FE81	0.04	-0.02	0.31	1	-0.08	0.09
FE86	-0.13	0.58*	0.07	-0.08	1	-0.08
IND	0.69***	0.51*	-0.70***	0.09	-0.08	1

A5. Correlation coefficients between differences in GDP growth (GROWTH),manufacturing production (IND), change in manufacturing R&D (RINV), differences in unit labor costs (DIFULC), and FDI (FE81, FE86) by "high-tech" firms in the Nordic countries, Norway 1975-1990

	GROWTH	RINV	DIFULC	FE81	FE86	IND
GROWTH	1	0.44*	-0.37	-0.4	-0.43*	0.33
RINV	0.44*	1	-0.36	-0.1	0.22	0.29
DIFULC	-0.37	-0.36	1	0.39	-0.15	-0.27
FE81	-0.4	-0.1	0.4	1	-0.51**	-0.22
FE86	0.43*	0.22	-0.15	-0.51**	1	-0.2
IND	0.33	0.29	-0.27	-0.22	-0.29	1

A6. Correlation coefficients between differences in GDP growth (GROWTH),manufacturing production (IND), change in manufacturing R&D (RINV), differences in unit labor costs (DIFULC), and FDI (FE81, FE86) by "high-tech" firms in the Nordic countries, Sweden 1975-1990

	GROWTH	RINV	DIFULC	FE81	FE86	IND
GROWTH	1	-0.16	-.70***	-0.48*	-0.06	0.57**
RINV	0.16	1	-0.42	0.01	0.12	0.06
DIFULC	-.70**	-0.42	1	0.69***	-0.08	-0.36
FE81	-0.48*	0.01	0.69***	1	-0.26	0.03
FE86	-0.06	0.12	-0.08	-0.26	1	-0.11
IND	0.57**	0.06	-0.36	0.03	-0.11	1

ELINKEINOELÄMÄN TUTKIMUSLAITOS (ETLA)
THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY
LÖNNROTINKATU 4 B, FIN-00120 HELSINKI

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