

The Single European Market, Swedish Investment Liberalisation, and Horizontal and Vertical Multinationals*

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ABSTRACT:

This paper analyses the effects of the Single European Market and Swedish Investment liberalisation on the structure of Swedish multinationals with their EU affiliates. The empirical results suggest that the determinants associated with horizontal and vertical multinationals have become increasingly relevant between 1974 and 1994. Horizontal multinationals are increasingly deterred by large plant-level economies of scale, increasingly associated with large trade costs and relative factor endowment similarities, while vertical multinationals are increasingly associated with relative factor endowment differences. This suggests that integration has increased competitive pressures to increase efficiency in exploiting economies of scale, and specialisation according to comparative advantages.

Keywords: *Single European Market, Swedish Investment Liberalisation, Country Size, Factor Endowments, Horizontal & Vertical Multinationals*

JEL Classification: *F12, F21, F23*

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1. Introduction

This paper analyses Swedish investment liberalisation and the Single European Market programme and its implications for the structural composition of the relationship between Swedish multinationals and their EU affiliates. More specifically, it analyses the effects of these policy changes on the extent of horizontal and vertical integration between Swedish parents and their EU affiliates. In doing so, it extends the paper by Mathä (2000), which analysed the empirical relevance of the determinants associated with horizontal and vertical multinationals.

This paper is organised as follows: Section 2 describes the developments of importance to Swedish multinationals and their European affiliates during the 1980s and 1990s. Section 3 explores the theoretical aspects and derives the hypotheses. Section 4 briefly presents the data, variables and the econometric specification. Section 5 analyses the empirical results, and section 6 concludes.

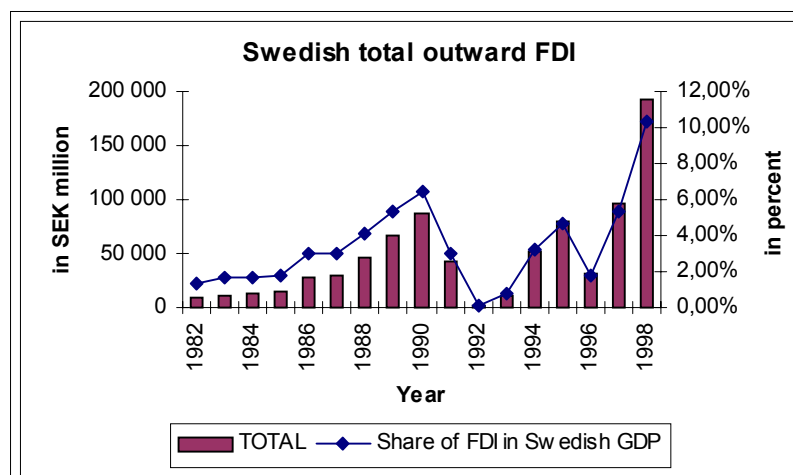
2. SEM, SIL and Horizontal versus Vertical Multinationals

World-wide FDI flows rose dramatically towards the end of the 1980s, as have Swedish outward FDI flows. In fact, Sweden experienced one of the single largest increases in, and highest levels of, total FDI outflows relative to GDP of all OECD countries in the period 1985-1994. As figure 1 indicates, Swedish FDI outflows relative to GDP reached an unprecedented 6.4% in 1990. After the recession in the beginning of the 1990s, Swedish outward FDI flows started to rise again in the mid 1990s. In 1998, Swedish outward FDI flows reached new record heights in exceeding 10% of Swedish GDP!

There are a number of reasons that contributed to the phenomenal rise of Swedish outward FDI flows in the late 1980s. The worldwide FDI boom between 1986 and 1990 was just one factor. The more significant factors relate to Sweden's economic performance, Swedish investment liberalisation, and European integration, to which we will now turn.

Figure 1:

Swedish outward FDI flows, absolute and as share of GDP, years 1982-1998



Source: Homepage of Swedish Central Bank and Statistics Sweden (1999)

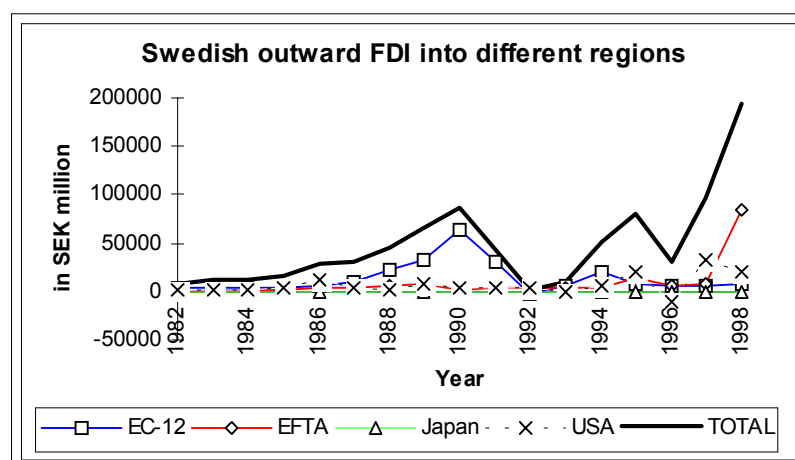
1.1. The Effects of European Integration

One key factor behind this increase in FDI flows is clearly the Single European Market (SEM) programme of the European Community. In removing artificial trade barriers, such as government procurement biases, and harmonising regulatory standards, the SEM was aimed at leading the EC from a segmented market towards one large unified market. Following assessments of the likely economic effects of the SEM, it was concluded that there were substantial benefits to be reaped. In particular, industries characterised by high degrees of imperfect competition and economies of scale were expected to benefit most, as EU wide competition would lead to increased efficiency, due to better exploitation of economies of scale, and thus lead to cost reductions, lower consumer prices and simultaneous expansion of production. Furthermore, member states have the opportunity of increasing specialisation according to comparative advantages (e.g. Emerson *et al.*, 1988). The consequences are twofold; it was feared that, firstly, EU firms were able to improve their competitive positions vis-à-vis non-EU firms in third markets, and secondly, that non-EU firms' market positions within the EU market would be eroded. Together with the positive estimates for increased future growth (e.g. Baldwin, 1989) these factors are incentives enough for firms to relocate to and/or expand production within the EU.¹

¹ Back in the 1960s and 70s, empirical studies already showed that market size and growth rates were important determinants in the EC's attraction of US FDI. For a review see for example UNCTAD (1993). This is also supported by the results of Aristotelous & Fountas (1996), which also point in the direction that market size matters.

The general worldwide FDI boom among the developed countries in the second half of the 1980s aside (e.g. UNCTAD, 1997), there is some evidence to suggest that this rush to the EU was a consequence of the Single European Market programme (European Commission, 1996, 1997). This is borne out by the increasing proportion of intra-EU FDI flows to total EU FDI flows, which increased from 41% in 1984, to 55% in the period 1985-90, and 62% in the period 1991-93 (European Commission, 1997). The influence of the SEM is also indicated by the EU's changing shares in the World Foreign Direct Investment Inward Stock, which declined from 36.7% to 29.3% in the five years 1980-85, i.e. the years just before the announcement of the Single European Act in 1985, and increased in the following five years from 29.3% to 40.0%. From 1990 to 1995 the share fell slightly, which can be attributed to Asia gaining in importance (Dunning, 1997a). This is also the case for Swedish FDI flows, where Asia could attract an increasing share in the 1990s.

Figure 2:
Swedish outward FDI flows into different regions, years 1982-1998



Source: Homepage of Swedish Central Bank

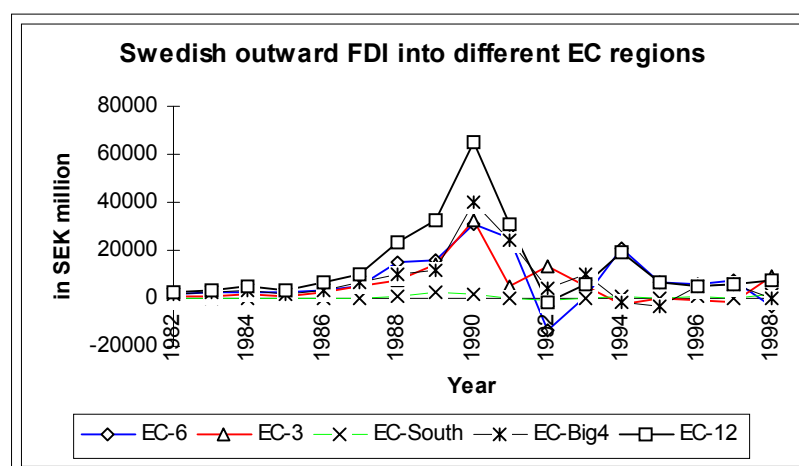
Most of the EU directed FDI flows came from third countries such as the USA, the EFTA countries, and Japan. These countries accounted for 33%, 31%, and 11% respectively of the accumulated inward FDI flows to the EU between 1984 and 1993 (Eurostat, 1995). In a simulation study, Baldwin, Forslid & Haaland (1995) came to the conclusion that the creation of the SEM led to an investment diversion effect for EFTA countries and an investment creation effect for EU countries.

Another important factor contributing to the rush into Europe is of specifically Swedish nature; A general worsening of Sweden's economic performance during the

1980s. Between 1970 and 1991 growth of GDP per person employed lagged behind the OECD average by 0.6%, while growth of output in the manufacturing sector grew approximately 0.3% slower. Reasons that may have contributed to this decline are, on one hand, the policy induced low return of human capital. Similarly, the return on physical capital has continuously been rather low when compared to other countries. On the other hand, hourly wage increases permanently exceeded productivity growth, leading to inflation pressure and subsequent devaluations of the Swedish Krona to restore international competitiveness (Lindbeck *et al.*, 1994).

As figure 2 demonstrates, Swedish FDI flows were primarily directed towards the EU between 1987 and 1992. The reported increase in FDI flows to the EFTA countries in 1998 is due to huge Swedish investments in Finland, which is still labelled as EFTA country in this figure. Within the EU, the main share of Swedish FDI was targeted at the four big EC countries, i.e. Germany, France, the UK and Italy. As shown in figure 3, in absolute terms the Southern European countries did not attract any significant FDI flows from Sweden.

Figure 3:
Swedish outward FDI flows into Different EC regions, years 1982-1998



Source: Homepage of Swedish Central Bank

A similar picture emerges when analysing the number of foreign affiliates, total assets and total employment per country and the changes therein. Between 1986 and 1990, the number of affiliates increased virtually for all EC-6 countries, except in France. The smaller countries, such as the Netherlands and Bel-Lux countries in particular, could attract new investments from Sweden. The countries, which could attract most new investments, were the UK and Germany, i.e. incidentally Sweden's two

most important trading partners. The EC-South could attract most new investments from Sweden in relative terms. However, these changes were not very large in absolute terms.

Table 1:
*Total number of foreign affiliates, total assets in current prices,
and total affiliate employment, years 1986-1994, per country*

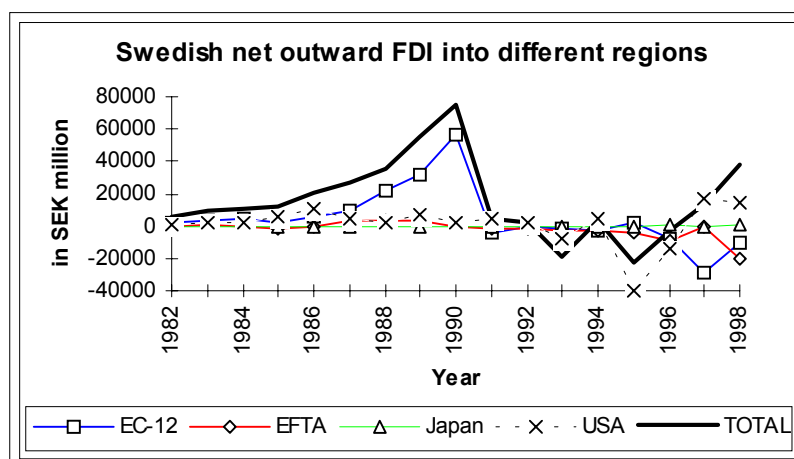
Year	Total no. of foreign affiliates			Total assets in current prices			Total affiliate employment		
	1986	1990	1994	1986	1990	1994	1986	1990	1994
EC-6	204	241	210	51855	99498	140344	93000	114182	94705
Bel-Lux	13	17	19	5188	10651	17734	9036	9881	9594
France	58	53	44	9779	14004	20735	18024	18431	15005
Italy	32	46	33	16991	24146	38675	30226	29460	29318
Netherlands	25	35	35	5239	7661	10032	7905	11330	9037
Germany	76	90	79	14658	43036	53168	27809	45080	31751
EC-3	100	139	111	13996	30581	33932	27878	48994	31072
Denmark	40	46	37	5374	8433	7003	10669	11615	8016
UK	55	87	68	8217	21263	26250	16167	36463	22287
Ireland	5	6	6	405	885	679	1042	916	769
EC-South	30	33	23	4307	12200	11070	11436	15564	9438
Portugal	9	10	8	1401	2861	2807	3450	3925	1368
Spain	21	21	14	2906	9123	8113	7986	10952	7815
Greece	0	2	1	0	216	150	0	687	255
All	334	413	344	70158	142279	185346	132314	178740	135215

Source: Andersson et. al. (1996) and Braunerhjelm & Ekholm (1998)

The investment activity slowed down, however, during at the beginning of the 1990s. To a large extent, this can be attributed to the international recession and to the divestment of acquired affiliates, which do not contribute to the core activities. Similarly, Swedish outward FDI plummeted abruptly in 1991. This is borne out in Figures 1 and 2. This sudden halt can be entirely explained by the worst economic recession since the 1930s to hit Sweden between 1991 and 1994. Swedish GDP fell by 6% between 1991 and 1993, while manufacturing output fell by approximately 17%. This recession was accompanied by a huge depreciation of the Swedish Krona. The depreciation was approximately 20% against the ECU between September 1992 and May 1993 (Lindbeck et al., 1994).

In 1993, Swedish outward FDI began to rise again. There are, however, some interesting differences between the FDI boom in the late 1980s and that in the 1990s. This is revealed in Figure 4. The rise in Swedish outward FDI was accompanied by a simultaneous rise in inward FDI flows. The largest increase in FDI inflows to Sweden came from the USA. Moreover, for the first time in three decades, outward FDI was outstripped by inward FDI in 1993.

Figure 4:
Swedish net outward FDI flows to different regions



Source: Homepage of Swedish Central Bank

2.2. Swedish Investment Liberalisation (SIL)

The ultimate aim of the SEM is a true internal market, which incorporates the four freedoms, i.e. the free mobility of goods, services, labour and capital. Capital mobility was restricted in many European member states and other third countries, such as Sweden, until the mid-1980s. Removing this restriction has important implications, especially for the existence of multinationals. It was not until the mid 1980s that Sweden started to liberalise its financial markets. In 1986, the external financing requirement was abolished, and in 1987, the deregulation was extended, to include real estate abroad. From 1989 onwards, this included insurance (OECD, 1996). Not surprisingly therefore, Swedish banks, real estate and insurance companies increased their investments abroad by 500% in current prices during the years 1987-1990 (Andersson & Fredriksson, 1993).

Prior to 1986, Swedish firms had to apply for the permission of the Bank of Sweden to invest abroad. The reason for these restrictions was the fear of Foreign Direct Investment worsening Sweden's balance of payments. Firms wishing to invest abroad had to demonstrate that their investments were not substitutes for Swedish exports (Swedenborg, 1985).

On the one hand, permission was almost always granted, which leads Swedenborg (1985) to conclude that the capital mobility restrictions did not

significantly affect the level or composition of Swedish FDI.² Foreign production by Swedish multinationals has rapidly increased during the period 1960-94, despite the presence of these capital mobility restrictions. Between 1965 and 1994, the yearly average increase in total affiliate sales was 14.3%. This rapid increase may also have been a consequence of Swedish trade unions adopting a favourable position towards outward FDI. Reasons behind their favourable position may include Sweden's low unemployment levels up until the recession at the beginning of the 1990s. Thus, the possibility of outward FDI leading to negative home country effects were of only minor concern. Moreover, trade unions were not only well informed about firms' investment plans due to their guaranteed worker participation at the management level of Swedish firms, but for the same reason, they could also veto any job threatening FDI decisions. Trade unions were also consulted during the FDI application process in order to determine the likely employment effects. In addition, as Swedish trade unions are highly centralised at a national level, they take into consideration the effects of FDI on both aggregate employment and on industrial growth (Blomström & Kokko, 1997).

On the other hand, the fact that permission was almost never denied is, however, no indication *per se* that capital controls have not affected the level and composition of Swedish outward FDI, as firms knew the formal requirements for a successful application. Firms knowing that they could not meet these requirements would certainly have been discouraged to apply in the first place.

Also, a number of Swedish studies have found empirical support for the suggestion that multinational production and exports are complements (Swedenborg, 1979, 1982; Blomström et al., 1988). These results are however challenged by Svensson (1996). He demonstrates that affiliate exports to third countries may substitute for parent exports to third countries. This is particularly interesting for two reasons. Firstly, this effect appears to be particularly prominent for European affiliates. These affiliates are, therefore, also used as export platforms. Secondly, he uses data spanning from 1974 to 1990, while the other studies refer to data from the 1960s and 1970s. It would have been very interesting for the purpose of this paper to know whether structural differences emerge after 1986.

² It has been estimated that only about 1% of all applications have been denied during the second half of the 1970s. For a review see Blomström & Kokko (1994, 1997).

Table 2:
Total parent exports to EC and to EC affiliates, which are accounted for by intermediate products

Industry	Parents' intermediates exports to affiliates as share of parents' total exports to affiliates		Parents' intermediates exports to affiliates as share of total parent exports to the EC	
	1986	1990	1986	1990
Basic Industries	79%	65%	5%	3%
Chemicals	61%	81%	10%	19%
Engineering	50%	75%	12%	33%
All Industries	53%	75%	12%	18%

Source: Andersson et al. (1996)

Complementarity of affiliate production and exports is the likely outcome if multinationals are either forward and / or backward integrated. Table 2 illustrates that, judging from aggregate data, Swedish multinationals, indeed, seem to be to a significant extent vertically integrated with their EU affiliates. However, as argued previously, it is not entirely clear whether this position reflects the natural position of Sweden, or whether it reflects an artefact of the capital mobility restrictions and a result of the remaining non-tariff barriers being in place until the mid 1980s.

In 1990, almost 50% of all affiliates did not import from the parent company at all. This is illustrated in table 3. Thus, on aggregate, these statistics point towards increased horizontal multinational activity.

Table 3:
Import propensities of foreign affiliates, and the proportion of intermediates in their total imports, by entry mode

Measure	1970	1974	1978	1986	1990
<i>Greenfield Investment</i>					
Total imports from parents / sales	20%	21%	22%	20%	20%
Share of intermediates	35%	44%	46%	53%	78%
Proportion of affiliates without imports from parent	n.a.	18%	11%	16%	19%
<i>Acquisition</i>					
Total imports from parents / sales	8%	10%	10%	7%	7%
Share of intermediates	53%	59%	66%	52%	63%
Proportion of affiliates without imports from parent	n.a.	28%	30%	38%	47%

Source: Andersson et al. (1996)

Table 2 suggested, however, that the relationship between Swedish parents and their EU affiliates be increasingly of a vertical nature. This apparent contradiction is demonstrated in table 4, which refers to the sample used in the estimations. The table shows three different measures of vertical forward integration and one measure of vertical backward integration between Swedish parents and their EC affiliates. For each of these measures, three different statistics are presented. There are significant differences with regard to the median, the average, and the aggregate share. It is striking that the basic conclusion depends on which of the different statistics is referred to.

Table 4:
*Vertical integration between parent and European affiliates,
median, average, and total average*

	Parents' intermediates exports to parents' exports to EC affiliates	Parents' intermediates exports to total parent exports to the EC	Parent's intermediates exports to EC affiliates sales	Affiliate exports to Sweden to EC affiliate sales
Median^a				
1974	52.3%	8.4%	4.2%	2.8%
1978	46.0%	4.2%	4.2%	2.0%
1986	41.1%	6.3%	4.7%	1.9%
1990	36.0%	0.4%	0.0%	1.2%
1994	25.0%	0.3%	0.6%	1.6%
Average^b				
1974	52.4%	19.8%	9.4%	12.5%
1978	53.4%	15.5%	10.5%	15.7%
1986	44.0%	12.9%	9.6%	9.2%
1990	46.0%	11.4%	8.1%	10.3%
1994	43.4%	15.0%	9.5%	10.3%
Aggregate share^c				
1974	38.3%	13.1%	6.2%	3.19%
1978	49.4%	15.6%	9.6%	4.19%
1986	50.4%	12.8%	7.9%	6.99%
1990	69.6%	18.7%	8.8%	6.84%
1994	74.8%	21.3%	11.4%	15.3%

^{a,b} median or average of the respective share per parent company.

^c the sum of parents' total intermediate exports to affiliates as share of the sum of total exports to the EC, total exports to EC affiliates, or total EC affiliate sales.

For all three different measures of vertical forward integration, the median reveals a clear tendency to fall over time. The tendency towards more predominantly horizontally integrated multinationals is particularly evident for the two measures, which are expressed as the share in either total parent exports to the EC or as the share in total EC affiliate sales. For the these two measures, the median dropped from 6.30% and 4.65% in 1986 to 0.44% and 0.00% in 1990 respectively. With regard to the average, the picture is mixed. With regard to parents' intermediates exports as a share of

EC affiliate sales, there is for example no indicative trend, while it is possible to observe a slight negative trend for the other two measures of vertical forward integration. To the contrary, the aggregate share shows a continuing trend of increasing. This is particularly the case after 1986. Moreover this table successfully replicates some of the descriptive statistics presented by Andersson *et al.* (1996), as shown in table 2.

The underlying reason for these differences may be that the larger and well-established Swedish multinationals are predominantly vertically integrated, while the new and smaller multinationals are primarily horizontally integrated. Furthermore, despite the increase in the relative number of predominantly horizontally integrated multinationals in the total population of Swedish multinationals, the extent of vertical integration between parent affiliates has increased on aggregate. Thus, the larger multinationals expanded their European operations more rapidly, and thereby chose increasingly to vertically integrate.

Similar differences can be found with regard to the measure of vertical backward integration. The median shows signs of increased horizontal integration. In 1994, the median started to increase again. The average declined between 1974 and 1986 and increased thereafter, while the aggregate share shows signs of increased vertical backward integration over time, and a particularly strong increase between 1990 and 1994. The reasons are similar to those given for the different measure of vertical forward integration. The increase in affiliate exports to Sweden may be explained with large multinationals acquiring large foreign firms, which previously exported to Sweden. Thus, on aggregate, Swedish multinationals appear to be vertically backward integrated.

Therefore the question may be posed as to whether the observed complementarity between multinational production and exports reflects the natural position of Sweden, or whether it reflects an artefact of the capital mobility restriction that was in place until the mid 1980s?

3. Theoretical Aspects

On the theoretical front there have been numerous developments incorporating multinationals into general equilibrium new trade theory in recent years. Most of the contributions focus on the determinants of horizontal multinationals (e.g. Brainard,

1993; Markusen & Venables (1996a,b, 1998). This case has also been argued to be empirically of more relevance (e.g. Markusen, 1995; Davies & Lyons, 1996).

Markusen et al., 1996 provide a synthesis of the determinants of respective horizontal and vertical multinationals. This also seems to be the relevant theoretical framework in the case of Swedish multinationals in the EU. Firstly Swedish multinationals show significant signs of vertical integration with their European affiliates, and secondly both the determinants of horizontal and vertical multinationals are found to be of relevance (Mathä, 2000). The propositions of the theoretical model by Markusen et al. (1996) are summarised in table 5.

Table 5:
Dominant Production Regime and Country Characteristics

Regime	Hypothesis	Characteristics
Horizontal multinationals	(1)	• firm-level economies of scale are large,
	(2)	• plant level economies of scale are low,
	(3)	• countries are large,
	(4)	• trade costs are moderate to high,
	(5)	• countries are similar in their relative factor endowments,
	(6)	• countries are similar in size.
Vertical multinationals	(7)	• trade costs are moderate to low,
	(8)	• countries differ significantly in their relative factor endowments.
National exporting firms	(9)	• trade costs are low and countries are similar in their relative factor endowments and size,
	(10)	• trade costs are moderate and countries are very different in size.

Source: Markusen et al., (1996)

The emergence of horizontal and vertical multinationals depends on the level of firm-level economies of scale and trade costs relative to plant-level economies of scale, country size and relative factor endowment differences and similarities. For example, if the two countries in question are both similar with regard to their relative factor endowments and their size, and trade costs are high, horizontal multinationals would tend to emerge. The basic idea is simply that *potential* multinationals need large firm-level or multi-plant economies of scale, i.e. firm specific assets, to successfully compete with indigenous firms. Additionally, they trade off the benefits of proximity to consumers, which saves transport costs, with single plant production, which enables the firm to benefit from plant-level economies of scale. The removal of an investment ban

would not result in the emergence of horizontal multinationals in the case of low transport costs, as setting up affiliates abroad requires additional plant set up costs, without being able to save transport costs. In the opposite, i.e. high transport costs, horizontal multinationals would tend to emerge.

If relative factor endowments are very different, and the smaller country is relatively well endowed with the production factor intensively used in the upstream production process, i.e. provision of skilled labour intensive headquarter services, we would expect small country based vertical multinationals to emerge. This is if trade costs are sufficiently low. In this case vertical multinational production offers two cost advantages over exporting. Low factor prices of the respective production factors used intensively in the respective production stages, i.e. skilled labour in headquarter services in the home country and unskilled labour in final production in the host country, and not least important low transport costs.

In this context of this model, the Swedish position seems to correspond to the case of a small country, which is well endowed with the production factor intensively used in headquarter services. Firstly, Sweden has a disproportionate share of the largest multinationals in the world in relation to its country size (Andersson et al., 1996). Secondly, as illustrated in table 2, Swedish multinationals are to a significant extent vertically integrated with their EU affiliates. This is if the composition of Swedish multinationals is described at the aggregate level.

If country size differences become too pronounced, however, production in the smaller country cannot be sustained any more, as the output level is not sufficient to recoup the fixed costs for the additional production plant. Hence, the association of horizontal multinationals with large, but similar country sizes.

The Effects of SEM and SIL

SEM and SIL potentially affect the structural composition of Swedish multinationals in numerous ways. Some of these individual effects may be overlapping, and hence reinforcing each other, while others may move into opposite directions. Clearly, the effects cannot be pinpointed to its effects on one single independent variable. In other words, the impacts of the SEM and SIL cannot be measured solely by a dummy variable, for example by indicating the significance of non-tariff barriers in different industries.

Rather, the impact of the SEM and SIL is a dynamic process and is mainly affects the structural composition of Swedish multinationals through its effect on other variables.³ Variables likely, and subsequently also proven, to be affected by the SEM programme are per capita income levels and differences, and the structure and location of industries. These effects will gradually build up over time. The short run effects mainly consist of increased efficiency and competition via better exploitation of economies of scale and improved allocation of production factors according to comparative advantages. Meanwhile, the medium and long-term effects are associated with reallocation and accumulation effects, such as improved growth rates and changes in per capita incomes. (Emerson et al., 1988; European Commission, 1996). In terms of the Markusen et al. (1996) model, it is therefore not appropriate to regard the effects of the SEM and SIL as a simple reduction in variable trade costs.

The effects of Swedish investment liberalisation are straightforward. If they really had an effect on the composition of multinationals and the relationship with their affiliates, then SIL can be regarded as a relaxation of external constraints. A similar statement may be made about the SEM, if it achieves what it set out to achieve, i.e. the removal of the remaining non-tariff barriers, market imperfections and inefficiencies. The implications of the SEM for horizontal and vertical multinationals are very similar to those of the SIL.

Non-tariff barriers reduce competition, as firms can survive profitably despite producing below the minimum efficient scale of production. NTBs also impede specialisation of industries, as less efficient and productive locations are sheltered from competition. The removal of these non-tariff barriers puts these industries under increasing pressure to restructure and become more efficient. Therefore, the exploitation of economies of scale will become more important in both the intermediate and the final goods markets.

Additionally, EU integration will lead to the relocation of some production to more efficient regions in the Community. Such relocation will also result in further geographical fragmentation of production stages with different factor intensities along the line of countries' respective comparative advantages. In the case of vertical multinationals, it is thus likely that relative factor endowment differences, and

³ e.g. Dunning (1997a,b) on the effects of the SEM.

differences in technology, skill and human capital will become more important location factors than they were prior to the EU integration process.

Summarising the discussion, it can be argued that both SEM and SIL will relax the artificial constraints, which were in place prior to mid 1980s. Hence, the determinants associated with the respective multinationals are expected to become increasingly relevant for the determination of Swedish multinationals and the nature of integration with their EU affiliates.

Table 5 cont'd:

Effects of Single European Market and Swedish Investment Liberalisation

Hypothesis 11: SEM and SIL lead to the increasing association of the horizontally and vertically integrated multinationals with their respective determinants (Hypotheses 1-8).

4. Data, Econometric Specification and Variable Definition⁴

The data is taken from the database at the Research Institute of Industrial Economics (IUI) in Stockholm. This database contains information on the foreign operations of individual Swedish multinationals with more than 50 employees in the manufacturing industry. We shall consider the operations of Swedish multinationals in ten individual EU member states. Ireland and Luxembourg had to be excluded, the STAN database, from which industrial variables were taken, includes neither of these countries. Data for Germany refers to West Germany prior to 1990 and to united Germany from 1991 onwards. The variables are defined in million SEK and 1990 prices. The analysis covers the years 1974, 1978, 1986, 1990 and 1994. The data set is pooled over these years. Interaction variables are used to test for structural differences between horizontal and vertical multinationals.

The dependent variable *AFFSH* takes account of exports and multinational production being simultaneously determined. It is defined in table 6, where the production volume of a multinational *i* in country *k* at time *t* is defined as the sum of all affiliates' total sales in country *k* at time *t* minus the sum of their total imports from their parent company in Sweden at time *t*. Thus, pure resale activities of imported products are separated from affiliates' production from. Exports are defined as firm *i*'s total exports to country *k* at time *t*. Exports include both exports of finished products,

⁴ The data, variables and specification are identical to Mathä (2000).

which may be sold by the affiliate in country k , and intermediate products, which are used by the affiliate for further processing. Horizontal and vertical multinationals are distinguished in employing interaction variables, which take account of the extent of vertical integration between parent and its EU affiliates.

AFFSH is censored at both tails, as firms export to EU countries. As estimation by Ordinary Least Squares will result in biased coefficient estimates (e.g. Maddala, 1983; Greene, 1993) we formulate a Tobit regression model, which accounts for censoring at both the lower and upper tail.

Table 6
Table with Variables and Data Sources

Proxy	Variable Definition	Data Source
<i>Dependent Variable</i>		
$AFFSH_{i,k,t}$	$\frac{Production_{i,k,t}}{Production_{i,k,t} + Exports_{i,k,t}}$	IUI database
<i>Explanatory Variables</i>		
$R\&D_{i,t}$	The ratio of total R&D expenditure to world-wide sales	IUI database
$LSCALE_{i,k,t}$	The log of the ratio of the average plant size in terms of employees to the firm size in the Swedish market	Firm size taken from IUI database. Swedish industry census of production at the 3 and 4 digit level of the ISIC classification. Years 1975, 1978, 1987, 1990, 1993.
$LTRADE_{i,t}$	The log of industry specific trade and packaging costs expressed as share of industry sales	Swedish industry census of production at the 3 and 4 digit level of the ISIC classification. Years 1975, 1978, 1987, 1990, 1993.
$LGDP_{k,t}$	Country size expressed as log of GDP	OECD National Accounts
$LINCDEF_{k,t}$	$\log\left(\frac{Per\ Capita\ GDP_{k,t}}{Per\ Capita\ GDP_{SWE,t}}\right)$	OECD National Accounts
$LVADIF_{j,k,t}$	$\log\left(\frac{Value\ Added\ Per\ Employee_{j,k,t}}{Value\ Added\ Per\ Employee_{j,SWE,t}}\right)$	OECD STAN database, at the 3 digit level of the ISIC classification.
$LWAGEDIF_{j,k,t}$	$\log\left(\frac{Compensation\ Per\ Employee_{j,k,t}}{Compensation\ Per\ Employee_{j,SWE,t}}\right)$	OECD STAN database, at the 3 digit level of the ISIC classification.
$LUNITDIF_{j,k,t}$	$\log\left(\frac{Unit\ Labour\ Cost_{j,k,t}}{Unit\ Labour\ Cost_{j,SWE,t}}\right)$	OECD STAN database, at the 3 digit level of the ISIC classification.

Table 6 con't
Table with Variables and Data Sources

<i>Interaction terms indicated by suffix -V</i>		
$VFEU_{i,t}$	$\frac{\sum_k \text{Export of Intermediates to Affiliates}_{i,k,t}}{\sum_k \text{Affiliate Production}_{i,k,t}}$	
$VBEU_{i,t}$	$\frac{\sum_k \text{Affiliate Exports to Sweden}_{i,k,t}}{\sum_k \text{Affiliate Production}_{i,k,t}}$	IUI Database
$VFBEU_{i,t}$	$VFBEU_{i,t} = VFEU_{i,t} + VBEU_{i,t}$	

Note: The subscript i, j, k , and t denotes the firm, industry, country, and time specific component, respectively. The prefix L denotes that the variable is expressed in logarithmic form to reduce heteroscedasticity. This was not possible for $R\&D$ as some values contain zeros.

5. Econometric Results

All estimations are shown in the respective tables in the appendix. Specification (I) concerns the estimates of forward integrated multinationals, i.e. uses the interaction variable $VFEU$, while specifications (II), concerns those of vertically backward integrated multinationals, i.e. $VBEU$. Specification (III) employs $VFBEU$ as interaction variable.

We separate the sample according to the two different sub-periods in order to analyse the effects of European integration and Swedish investment liberalisation.⁵ Hence, each specification appears twice, the only difference being the length of pre-integration and integration sub-period samples. This is done to see how robust the results are to period-specific sub-samples. The estimates for the period 1974-1994 are identical to those in Mathä (2000). They serve as a benchmark for the log-likelihood Ratio tests, identifying firstly whether there is a structural break in the series, and secondly whether the structural break is stronger with regard to the sub-periods 1974-1978 and 1986-1994 or for the sub-periods 1974-1986 and 1990-1994. A priori it is not evident when exactly the hypothesised integration effects may emerge. From the Log Likelihood Ratio statistics, it seems that the structural break is stronger if the samples are separated into the sub-periods 1974-1986 and 1990-1994.

⁵ Time specific interaction variables could also have been used. This would, however, have meant to estimate two-way interaction variables, which would have made the analysis less tractable.

Also, the interpretation of the empirical results emphasises the differences in the sub-samples, and not the differences between horizontal and vertical multinationals. A detailed analysis of the latter can be found in Mathä (2000).

5.1. Specifications (I), (II), (III)

Firstly, the results demonstrate that the share of affiliate production of Swedish multinationals is both explained by the determinants associated with horizontal multinationals and vertical multinationals. These results seem quite robust across different types of vertical integration as well as robust to across different time sub-periods. It also appears that the strength of the determinants is larger in the integration sub-periods 1986-1994 and 1990-1994 than in the pre-integration counter periods.

Horizontal versus Vertical Multinationals

The share of foreign production to total foreign sales, *AFFSH*, of horizontally integrated multinationals are primarily explained by low plant-level economies of scale relative to firms size, large trade costs, large host country size, and in similarities in per capita income, labour productivity, wages and unit labour costs. The coefficients of these variables are highly significant. Only the coefficient of the R&D intensity does not have the expected sign. It is negative and significantly so, in particular in later sub-periods. This result is contrary to expectation. As Norbäck (1998) pointed out, this may be related to the fact that the technology transfer from parents to affiliates is not independent of the magnitude of the R&D intensity, as commonly assumed in the literature, as well as in the theoretical model by Markusen *et al.* (1996).

This particularly interesting as this effects appears to be strongest after 1986, and may therefore be explained as an effect of the massive FDI investment in Europe, which by large is done via mergers and acquisitions. In the short- to medium-term, production and technologies are transferred to the acquired affiliate. The costs of these transfers may well be related to the magnitude of the R&D intensity.

The empirical results suggest further that vertically integrated multinationals are able to compensate production below minimum efficient scale, this being the case for vertically forward integrated multinationals in particular, in geographically fragmenting production stages to exploit difference in relative factor endowments, such technologies, human capital and labour costs. Also, there is some evidence that the emergence of vertically integrated multinationals is promoted by low trade costs. This is particularly

the case for the sample covering the period 1974-1994. This result is strongest for both vertically forward and backward integrated multinationals.

The host country size seems of greater importance for vertically forward integrated than for horizontally integrated multinationals. There is some weak evidence that vertically backward integrated multinationals have the opposite tendency, particularly during the period 1974-1986.

Integration Effects

The Wald-statistics in the tables provide a test of whether the coefficients in the respective sub-periods are significantly different from each other. The clearest effects of SEM and SIL are that horizontal multinationals are increasingly associated with large economies of scale. In other words, large economies of scale deter horizontal multinationals more after 1986 than prior to SEM and SIL. This is in line with the fact that much of the industrial restructuring occurs via mergers with, and acquisitions of, competitors. The likely take-over targets are host country competitors, which operate in the same industry, produce a similar product range, and have similar technological and productive capabilities. The SEM has also meant that fast market access becomes increasingly important. Some of the acquisitions may also be motivated by gaining access to better distribution through established distribution and wholesaling networks. In doing so, firms gain the necessary economies of scale to compete successfully in an increasingly competitive environment. This phenomenon was also reported of Swedish firms, who took the principal bidding role in the M&A process during the period 1990-1995 (European Commission, 1996). Acquired affiliates are much less likely to import from the parent company (Andersson et al., 1996), and may have been subject to the capital control restrictions for this reason.

Large trade costs have an increasingly positive effect on horizontally integrated multinationals. This is particularly the case in specification (II) in the sub-period 1990-1994. Again, this change is consistent with increasing competitive environment, forcing companies to restructure their foreign operations. It is conceivable that some potential multinationals were constrained by Swedish capital control restrictions. Prior to Swedish investment liberalisation some firms may have exported to individual EU countries rather than established horizontally integrated affiliates, despite the fact that

the size of the industry specific trade costs may have favoured multinational production over exporting.

Acquired affiliates are also less dependent on technology transfer, as is embodied in intermediate products, than affiliates that have been established through greenfield investment. In short-term, however, personnel, scientists, and other managerial staff have to be sent back and forth to and from acquired affiliates in order to supervise the implementation of firm-specific assets. Thus, significant costs may have to be incurred, which may in turn be related to the firms-specific assets, i.e. the R&D and marketing intensities. This may explain the significantly negative coefficient of the R&D intensity during the integration period. The Wald-statistic does, however, not indicate the presence of a structural break.

Another aim of the European integration process is to reduce the dissimilarities of countries with respect to their per capita income levels. One such means is to provide structural aid from Brussels to poorer regions and countries in the community. Recent evidence indicates that indeed countries are converging (European Commission, 1996). This is important in so far as this process may lead to increased multinational activity. Moreover, it may lead to horizontally rather than vertically integrated multinationals. Again, this is a relevant point, as the emergence of horizontal multinationals was not particularly welcome prior to removal of the capital control restrictions in 1986.

With regard to relative factor endowments, there is indeed some evidence to suggest that horizontal multinationals be increasingly attracted by similarities in relative per capita incomes and wages. This is the case in tables 7 and 9. In contrast, vertically forward integrated multinationals have an increased tendency to be attracted by differences in relative per capita incomes and wages during the integration period. This is very encouraging, as vertically forward integrated revealed a lesser tendency to be attracted by relative factor endowment differences during the 1970s and 1980s than vertically backward integrated multinationals. Hence, the fact that no significant differences appear in the separate subgroups with regard to vertically backward integrated multinationals is not discomfoting. These multinationals have already shown strong tendencies to be attracted by differences in relative factor endowments in the

1970s, and continue to be so, possibly to a slightly lesser extent, in the 1980s and 1990s.⁶

These results are relevant in so far as prior Swedish investment liberalisation and European integration, vertically forward integrated multinationals had a tendency to produce in industries with similar technologies, as would be predicted for horizontally integrated multinationals. This stems from the fact that the coefficient estimates were not significantly different from horizontally integrated multinationals during the 1970s.

These changes are consistent with the objectives of the SEM to reduce non-tariff barriers within the EU, which sheltered inefficient and unproductive industries. Hence, prior to the SEM programme, vertically forward integrated multinationals were forced to produce in less efficient locations due to market access considerations. Due to increased integration, vertical multinationals are able to reap the benefits of exploiting comparative advantages with regard to productivity, technology and human capital.

6. Concluding Remarks

This paper analyses how Swedish multinationals have been affected by the policy changes in Europe and Sweden in the mid and late 1980s. It was first demonstrated that the extent of vertical integration between parents and their affiliates depends crucially on the level of aggregation at which vertical integration between Swedish parents and their European affiliates is measured. Swedish multinationals appear to be increasingly vertically integrated if, for example, the sum of total parents' intermediate exports to EC affiliates is related to the sum of total parent exports to the EC. Thus, on the aggregate level, total statistics point towards increased vertical integration over time. The opposite, however, is the case with regard to the median of total intermediate exports to EC affiliates as a share of total parent exports to the EC per parent company. This may indicate that large Swedish multinationals are to an increasing extent, vertically integrated, while small and newly established multinationals are primarily horizontally integrated. Additionally, it appears that mixed forms of integration have become a less popular choice for Swedish multinationals after 1986.

⁶ As mentioned previously, one contributing reason may be that Swedish multinationals acquiring foreign competitors may sometimes appear more vertically backward integrated than they really are, this being particularly the case if former competitors were exporting to Sweden. In part, this may also in part explain the magnitude of the negative coefficient of *LUNITDIF* and the subsequent structural break reported in table 12.

Both the removal of Swedish capital mobility restrictions and the Single European Market programme have significantly affected Swedish multinationals. Horizontally integrated multinationals are increasingly deterred by large plant-level economies of scale. After 1986, supply side considerations have become increasingly important in determining the location of multinational production. This is consistent with the anticipated effects of increased efficiency and competition inside the EU. Similarly, horizontal multinationals are increasingly associated with large trade costs.

For vertically forward-integrated multinationals are increasingly explained by relative factor endowment differences in the integration period, while the opposite was the case in the pre-integration period. Thus, these results indicate that foreign production of vertically forward-integrated multinationals tended to take place at less efficient locations to avoid non-tariff barriers and gain market access to individual markets. In contrast, horizontally integrated multinationals show some tendencies to be increasingly explained by technology and human capital similarities of industries. Thus, the policy changes have affected Swedish multinationals in a way that is consistent with the theoretical predictions.

Finally, it has to be mentioned that the restructuring process of Swedish multinationals, be it due to the SEM and/or the SIL, has not been completed during the period of this study. Further research in this area will be needed in the near future as it is therefore not clear whether these results merely reflect the short-run adjustment dynamics or indeed the new long-run equilibrium. This is also reflected by the sensitivity of the results with regard to the choice of the integration period.

7. Appendix

Table 7:
Tobit Estimates: Horizontally and vertically forward integrated multinationals, differences between periods 1974-1978 and 1986-1994

Specification	(Ia)				(Ib)				(Ic)				(Id)			
Dependent variable	AFFSH			WALD-Statistic	AFFSH			WALD-Statistic	AFFSH			WALD-Statistic	AFFSH			WALD-Statistic
Interaction variable	VFEU				VFEU				VFEU				VFEU			
Years	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$
No. of obs.	1698	443	1255		1698	443	1255		1698	443	1255		1698	443	1255	
<i>R&D</i>	-2.109	-0.158	-3.242	1.839	-2.395	-0.423	-3.544	1.835	-2.327	-0.278	-3.385	1.834	-2.062	-0.284	-3.209	1.642
	<i>-2.181</i>	<i>-0.081</i>	<i>-2.797</i>		<i>-2.454</i>	<i>-0.213</i>	<i>-3.030</i>		<i>-2.412</i>	<i>-0.140</i>	<i>-2.946</i>		<i>-2.109</i>	<i>-0.145</i>	<i>-2.734</i>	
<i>LSCALE</i>	-0.351	-0.276	-0.394	3.134	-0.350	-0.274	-0.392	3.220	-0.354	-0.274	-0.397	3.426	-0.351	-0.270	-0.394	3.577
	<i>-12.278</i>	<i>-4.871</i>	<i>-11.564</i>		<i>-12.320</i>	<i>-4.873</i>	<i>-11.638</i>		<i>-12.331</i>	<i>-4.848</i>	<i>-11.628</i>		<i>-12.342</i>	<i>-4.794</i>	<i>-11.631</i>	
<i>LTRADE</i>	0.141	0.082	0.118	0.115	0.144	0.082	0.119	0.122	0.154	0.081	0.138	0.296	0.149	0.100	0.126	0.060
	<i>3.150</i>	<i>0.925</i>	<i>2.085</i>		<i>3.268</i>	<i>0.939</i>	<i>2.131</i>		<i>3.486</i>	<i>0.929</i>	<i>2.475</i>		<i>3.344</i>	<i>1.128</i>	<i>2.234</i>	
<i>LGDP</i>	0.228	0.193	0.237	0.411	0.262	0.206	0.280	1.200	0.248	0.209	0.255	0.467	0.282	0.208	0.309	2.179
	<i>6.974</i>	<i>3.544</i>	<i>5.938</i>		<i>7.960</i>	<i>3.799</i>	<i>7.011</i>		<i>7.559</i>	<i>3.827</i>	<i>6.447</i>		<i>8.298</i>	<i>3.859</i>	<i>7.354</i>	
<i>LINCDEF</i>	-0.382	-0.189	-0.450	1.348												
	<i>-3.822</i>	<i>-0.983</i>	<i>-3.830</i>													
<i>LVADIF</i>					-0.284	-0.210	-0.327	0.300								
					<i>-3.111</i>	<i>-1.143</i>	<i>-3.087</i>									
<i>LWAGEDIF</i>									-0.327	-0.091	-0.416	2.682				
									<i>-3.480</i>	<i>-0.552</i>	<i>-3.715</i>					
<i>LUNITDIF</i>													-0.365	-0.414	-0.314	0.074
													<i>-2.252</i>	<i>-1.351</i>	<i>-1.560</i>	
<i>R&D-V</i>	7.053	20.082	9.083	0.717	7.535	22.036	9.832	0.915	7.352	19.250	9.564	0.563	7.209	21.654	9.228	1.065
	<i>2.448</i>	<i>1.606</i>	<i>2.585</i>		<i>2.638</i>	<i>1.798</i>	<i>2.773</i>		<i>2.533</i>	<i>1.551</i>	<i>2.693</i>		<i>2.483</i>	<i>1.880</i>	<i>2.625</i>	
<i>LSCALE-V</i>	0.455	0.607	0.470	0.200	0.471	0.632	0.493	0.207	0.475	0.598	0.505	0.093	0.472	0.631	0.484	0.234
	<i>3.996</i>	<i>2.222</i>	<i>3.369</i>		<i>4.092</i>	<i>2.322</i>	<i>3.519</i>		<i>4.086</i>	<i>2.232</i>	<i>3.578</i>		<i>4.151</i>	<i>2.328</i>	<i>3.513</i>	
<i>LTRADE-V</i>	-0.306	-0.796	-0.169	0.740	-0.347	-0.908	-0.207	1.043	-0.360	-0.775	-0.251	0.579	-0.330	-0.938	-0.200	1.215
	<i>-1.580</i>	<i>-1.170</i>	<i>-0.647</i>		<i>-1.890</i>	<i>-1.423</i>	<i>-0.817</i>		<i>-1.925</i>	<i>-1.212</i>	<i>-0.977</i>		<i>-1.785</i>	<i>-1.515</i>	<i>-0.786</i>	
<i>LGDP-V</i>	0.086	0.133	0.070	0.580	0.083	0.132	0.069	0.574	0.088	0.132	0.077	0.447	0.083	0.116	0.073	0.265
	<i>2.481</i>	<i>1.915</i>	<i>1.568</i>		<i>2.366</i>	<i>1.901</i>	<i>1.519</i>		<i>2.465</i>	<i>1.931</i>	<i>1.690</i>		<i>2.386</i>	<i>1.643</i>	<i>1.646</i>	
<i>LINCDEF-V</i>	-0.013	-0.233	0.183	0.318												
	<i>-0.047</i>	<i>-0.355</i>	<i>0.544</i>													
<i>LVADIF-V</i>					0.508	0.158	0.710	0.677								
					<i>1.655</i>	<i>0.283</i>	<i>1.898</i>									
<i>LWAGEDIF-V</i>									0.390	-0.309	0.643	2.760				
									<i>1.505</i>	<i>-0.663</i>	<i>1.929</i>					
<i>LUNITDIF-V</i>													0.713	1.328	0.582	0.148
													<i>1.158</i>	<i>0.742</i>	<i>0.782</i>	
Log likelihood	-1219.2	-335.5	-870.4		-1224.0	-335.7	-874.2		-1222.2	-336.1	-871.5		-1226.5	-335.3	-877.9	
Log likel. Ratio test				26.6				28.2				29.2				26.6

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

Table 8:
Tobit Estimates: *Horizontally and vertically forward integrated multinationals*, differences between periods 1974-1986 and 1990-1994

Specification	(Ia)				(Ib)				(Ic)				(Id)			
Dependent variable	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-
Interaction variable	VFEU			Statistic	VFEU			Statistic	VFEU			Statistic	VFEU			Statistic
Years	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$
No. of obs.	1698	837	861		1698	837	861		1698	837	861		1698	837	861	
<i>R&D</i>	-2.109	-1.460	-2.489	0.256	-2.395	-1.620	-3.011	0.454	-2.327	-1.601	-2.904	0.416	-2.062	-1.498	-2.315	0.154
	<i>-2.181</i>	<i>-1.256</i>	<i>-1.493</i>		<i>-2.454</i>	<i>-1.383</i>	<i>-1.772</i>		<i>-2.412</i>	<i>-1.368</i>	<i>-1.764</i>		<i>-2.109</i>	<i>-1.298</i>	<i>-1.334</i>	
<i>LSCALE</i>	-0.351	-0.271	-0.463	10.596	-0.350	-0.267	-0.462	11.124	-0.354	-0.270	-0.471	11.605	-0.351	-0.268	-0.467	11.456
	<i>-12.278</i>	<i>-7.226</i>	<i>-10.161</i>		<i>-12.320</i>	<i>-7.178</i>	<i>-10.257</i>		<i>-12.331</i>	<i>-7.195</i>	<i>-10.309</i>		<i>-12.342</i>	<i>-7.176</i>	<i>-10.271</i>	
<i>LTRADE</i>	0.141	0.050	0.212	2.467	0.144	0.060	0.199	1.866	0.154	0.067	0.216	2.200	0.149	0.070	0.216	2.024
	<i>3.150</i>	<i>0.842</i>	<i>2.524</i>		<i>3.268</i>	<i>1.019</i>	<i>2.416</i>		<i>3.486</i>	<i>1.131</i>	<i>2.644</i>		<i>3.344</i>	<i>1.180</i>	<i>2.580</i>	
<i>LGDP</i>	0.228	0.231	0.214	0.068	0.262	0.248	0.270	0.126	0.248	0.244	0.237	0.010	0.282	0.261	0.292	0.216
	<i>6.974</i>	<i>5.588</i>	<i>4.243</i>		<i>7.960</i>	<i>5.896</i>	<i>5.713</i>		<i>7.559</i>	<i>5.834</i>	<i>4.881</i>		<i>8.298</i>	<i>6.090</i>	<i>5.830</i>	
<i>LINCDIF</i>	-0.382	-0.208	-0.531	2.604												
	<i>-3.822</i>	<i>-1.615</i>	<i>-3.467</i>													
<i>LVADIF</i>					-0.284	-0.328	-0.290	0.039								
					<i>-3.111</i>	<i>-2.208</i>	<i>-2.390</i>									
<i>LWAGEDIF</i>									-0.327	-0.220	-0.428	1.262				
									<i>-3.480</i>	<i>-1.672</i>	<i>-3.258</i>					
<i>LUNITDIF</i>													-0.365	-0.453	-0.411	0.016
													<i>-2.252</i>	<i>-1.897</i>	<i>-1.759</i>	
<i>R&D-V</i>	7.053	6.015	10.594	0.481	7.535	6.361	11.730	0.642	7.352	5.834	11.992	0.869	7.209	6.490	10.873	0.443
	<i>2.448</i>	<i>1.392</i>	<i>2.122</i>		<i>2.638</i>	<i>1.559</i>	<i>2.206</i>		<i>2.533</i>	<i>1.416</i>	<i>2.322</i>		<i>2.483</i>	<i>1.601</i>	<i>2.095</i>	
<i>LSCALE-V</i>	0.455	0.415	0.492	0.084	0.471	0.427	0.491	0.059	0.475	0.420	0.535	0.190	0.472	0.444	0.481	0.020
	<i>3.996</i>	<i>2.929</i>	<i>2.222</i>		<i>4.092</i>	<i>2.912</i>	<i>2.268</i>		<i>4.086</i>	<i>2.916</i>	<i>2.430</i>		<i>4.151</i>	<i>2.987</i>	<i>2.258</i>	
<i>LTRADE-V</i>	-0.306	-0.294	0.086	0.539	-0.347	-0.397	0.108	1.026	-0.360	-0.372	0.035	0.677	-0.330	-0.399	0.121	1.063
	<i>-1.580</i>	<i>-0.947</i>	<i>0.207</i>		<i>-1.890</i>	<i>-1.368</i>	<i>0.266</i>		<i>-1.925</i>	<i>-1.253</i>	<i>0.089</i>		<i>-1.785</i>	<i>-1.353</i>	<i>0.296</i>	
<i>LGDP-V</i>	0.086	0.099	0.048	0.359	0.083	0.080	0.050	0.126	0.088	0.090	0.060	0.125	0.083	0.076	0.052	0.082
	<i>2.481</i>	<i>2.412</i>	<i>0.651</i>		<i>2.366</i>	<i>1.869</i>	<i>0.685</i>		<i>2.465</i>	<i>2.137</i>	<i>0.822</i>		<i>2.386</i>	<i>1.775</i>	<i>0.719</i>	
<i>LINCDIF-V</i>	-0.013	-0.823	0.635	5.760												
	<i>-0.047</i>	<i>-1.761</i>	<i>1.636</i>													
<i>LVADIF-V</i>					0.508	0.620	0.438	0.073								
					<i>1.655</i>	<i>1.138</i>	<i>1.120</i>									
<i>LWAGEDIF-V</i>									0.390	-0.185	0.826	3.426				
									<i>1.505</i>	<i>-0.463</i>	<i>2.213</i>					
<i>LUNITDIF-V</i>													0.713	1.508	0.336	0.714
													<i>1.158</i>	<i>1.428</i>	<i>0.374</i>	
Log likelihood	-1219.2	-611.5	-590.7		-1224.0	-613.4	-594.6		-1222.2	-614.3	-591.2		-1226.5	-614.1	-595.8	
Log likel. Ratio test				34.0				32.0				33.4				33.2

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

Table 9:
Tobit Estimates: Horizontally and vertically backward integrated multinationals, differences between periods 1974-1978 and 1986-1994

Specification	(IIa)				(IIb)				(IIc)				(IId)			
Dependent variable	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-
Interaction variable	VBEU			Statistic	VBEU			Statistic	VBEU			Statistic	VBEU			Statistic
Years	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$
No. of obs.	1655	435	1220		1655	435	1220		1655	435	1220		1655	435	1220	
<i>R&D</i>	-1.955	1.139	-2.928	2.723	-2.371	0.672	-3.149	2.406	-2.510	0.465	-3.228	2.279	-1.816	1.420	-2.784	2.815
	-2.207	0.509	-2.833		-2.729	0.299	-3.123		-2.871	0.209	-3.179		-2.078	0.621	-2.717	
<i>LSCALE</i>	-0.341	-0.210	-0.407	12.250	-0.343	-0.213	-0.407	11.991	-0.347	-0.215	-0.413	12.158	-0.338	-0.199	-0.404	13.859
	-12.285	-4.765	-11.554		-12.432	-4.908	-11.644		-12.367	-4.857	-11.622		-12.374	-4.631	-11.645	
<i>LTRADE</i>	0.214	0.183	0.214	0.065	0.219	0.175	0.225	0.179	0.231	0.185	0.244	0.239	0.217	0.194	0.216	0.031
	4.433	1.713	3.775		4.587	1.648	4.022		4.800	1.763	4.313		4.536	1.803	3.826	
<i>LGDP</i>	0.232	0.199	0.235	0.276	0.257	0.194	0.274	1.405	0.245	0.203	0.251	0.491	0.295	0.242	0.305	0.771
	6.972	3.632	5.815		7.794	3.595	6.896		7.359	3.699	6.247		8.405	4.214	7.243	
<i>LINCDIF</i>	-0.551	-0.573	-0.518	0.052												
	-5.166	-2.715	-4.262													
<i>LVADIF</i>					-0.460	-0.586	-0.425	0.406								
					-4.712	-2.595	-3.761									
<i>LWAGEDIF</i>									-0.480	-0.421	-0.495	0.098				
									-4.739	-2.090	-4.185					
<i>LUNITDIF</i>													-0.353	-0.308	-0.408	0.067
													-1.993	-0.956	-1.906	
<i>R&D-V</i>	1.231	-5.394	1.409	0.103	4.066	-0.589	2.749	0.025	5.883	1.772	4.161	0.013	-1.943	-13.075	0.194	0.369
	0.233	-0.267	0.219		0.778	-0.029	0.440		1.078	0.088	0.636		-0.363	-0.625	0.031	
<i>LSCALE-V</i>	0.224	0.350	0.360	0.001	0.172	0.308	0.369	0.019	0.174	0.311	0.395	0.035	0.074	0.016	0.260	0.307
	1.379	1.014	1.552		1.041	0.816	1.593		1.064	0.805	1.696		0.450	0.042	1.140	
<i>LTRADE-V</i>	-0.414	-0.338	-0.627	0.060	-0.450	-0.342	-0.796	0.156	-0.486	-0.407	-0.877	0.175	-0.277	-0.233	-0.499	0.052
	-1.140	-0.311	-1.361		-1.217	-0.325	-1.721		-1.311	-0.398	-1.861		-0.758	-0.216	-1.096	
<i>LGDP-V</i>	-0.025	-0.088	0.052	1.613	-0.035	-0.065	0.053	1.046	-0.035	-0.070	0.062	1.235	-0.010	-0.059	0.049	0.712
	-0.480	-1.089	0.694		-0.666	-0.739	0.710		-0.676	-0.774	0.804		-0.195	-0.567	0.657	
<i>LINCDIF-V</i>	2.113	3.793	1.226	4.163												
	4.317	3.519	1.887													
<i>LVADIF-V</i>					2.124	2.715	1.828	0.524								
					3.955	3.069	2.158									
<i>LWAGEDIF-V</i>									1.933	2.372	1.695	0.351				
									3.788	2.837	2.177					
<i>LUNITDIF-V</i>													0.279	1.869	0.231	0.181
													0.165	0.570	0.114	
Log likelihood	-1205.0	-320.7	-867.3		-1205.9	-322.6	-869.0		-1205.0	-324.1	-866.7		-1221.7	-333.3	-875.5	
Log likel. Ratio test				34.0				28.6				28.4				25.8

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

Table 10:
Tobit Estimates: Horizontally and vertically backward integrated multinationals, differences between periods 1974-1986 and 1990-1994

Specification	(IIa)				(IIb)				(IIc)				(IId)			
Dependent variable	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-
Interaction variable	VBEU			Statistic	VBEU			Statistic	VBEU			Statistic	VBEU			Statistic
Years	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$
No. of obs.	1655	829	826		1655	829	826		1655	829	826		1655	829	826	
<i>R&D</i>	-1.955	-0.824	-2.208	0.499	-2.371	-1.171	-2.668	0.608	-2.510	-1.336	-2.804	0.573	-1.816	-0.974	-1.705	0.139
	-2.207	-0.720	-1.388		-2.729	-1.046	-1.710		-2.871	-1.179	-1.783		-2.078	-0.857	-1.066	
<i>LSCALE</i>	-0.341	-0.220	-0.478	20.385	-0.343	-0.217	-0.478	21.532	-0.347	-0.221	-0.488	21.445	-0.338	-0.218	-0.478	21.658
	-12.285	-6.923	-10.032		-12.432	-6.977	-10.149		-12.367	-7.029	-10.105		-12.374	-6.904	-10.360	
<i>LTRADE</i>	0.214	0.092	0.322	4.715	0.219	0.079	0.318	5.289	0.231	0.101	0.334	5.000	0.217	0.111	0.308	3.488
	4.433	1.385	3.911		4.587	1.181	4.018		4.800	1.509	4.171		4.536	1.630	3.810	
<i>LGDP</i>	0.232	0.243	0.209	0.270	0.257	0.242	0.264	0.125	0.245	0.247	0.230	0.064	0.295	0.293	0.280	0.036
	6.972	5.593	4.197		7.794	5.612	5.776		7.359	5.660	4.789		8.405	6.366	5.851	
<i>LINCDIF</i>	-0.551	-0.547	-0.544	0.000												
	-5.166	-3.714	-3.563													
<i>LVADIF</i>					-0.460	-0.616	-0.371	1.423								
					-4.712	-3.839	-2.882									
<i>LWAGEDIF</i>									-0.480	-0.494	-0.474	0.009				
									-4.739	-3.267	-3.485					
<i>LUNITDIF</i>													-0.353	-0.352	-0.328	0.005
													-1.993	-1.397	-1.309	
<i>R&D-V</i>	1.231	-6.866	-3.239	0.043	4.066	-5.458	-1.148	0.059	5.883	-2.586	0.761	0.035	-1.943	-8.261	-1.363	0.158
	0.233	-1.000	-0.202		0.778	-0.805	-0.070		1.078	-0.368	0.046		-0.363	-1.174	-0.086	
<i>LSCALE-V</i>	0.224	-0.076	0.374	1.262	0.172	-0.186	0.410	2.258	0.174	-0.190	0.453	2.528	0.074	-0.198	0.168	0.802
	1.379	-0.391	1.068		1.041	-0.896	1.213		1.064	-0.922	1.302		0.450	-0.935	0.480	
<i>LTRADE-V</i>	-0.414	0.259	-0.836	1.230	-0.450	0.443	-1.060	2.275	-0.486	0.313	-1.128	2.084	-0.277	0.284	-0.353	0.363
	-1.140	0.547	-0.965		-1.217	0.894	-1.226		-1.311	0.644	-1.294		-0.758	0.557	-0.381	
<i>LGDP-V</i>	-0.025	-0.140	0.080	2.380	-0.035	-0.157	0.085	2.809	-0.035	-0.158	0.095	3.032	-0.010	-0.116	0.080	1.834
	-0.480	-2.235	0.623		-0.666	-2.393	0.660		-0.676	-2.411	0.731		-0.195	-1.651	0.633	
<i>LINCDIF-V</i>	2.113	2.752	1.138	2.021												
	4.317	3.945	1.270													
<i>LVADIF-V</i>					2.124	2.609	1.477	0.998								
					3.955	4.341	1.538									
<i>LWAGEDIF-V</i>									1.933	2.207	1.540	0.378				
									3.788	3.700	1.701					
<i>LUNITDIF-V</i>													0.279	1.814	-7.777	2.997
													0.165	0.938	-1.498	
Log likelihood	-1205.0	-602.0	-585.7		-1205.9	-600.3	-587.9		-1205.0	-603.1	-585.3		-1221.7	-615.4	-587.3	
Log likel. Ratio test				34.0				35.4				33.2				38.0

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

Table 11:
Tobit Estimates: Horizontally and vertically forward & backward integrated multinationals, differences between periods 1974-1978 and 1986-1994

Specification Dependent variable Interaction variable	(IIIa)				(IIIb)				(IIIc)				(IIId)			
	AFFSH VFBEU			WALD- Statistic	AFFSH VFBEU			WALD- Statistic	AFFSH VFBEU			WALD- Statistic	AFFSH VFBEU			WALD- Statistic
Years	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$	1974-1994	1974-1978	1986-1994	$\chi^2 =$
No. of obs.	1655	435	1220		1655	435	1220		1655	435	1220		1655	435	1220	
<i>R&D</i>	-1.643 <i>-1.406</i>	-0.155 <i>-0.062</i>	-3.167 <i>-2.186</i>	1.086	-2.191 <i>-1.851</i>	-0.679 <i>-0.262</i>	-3.617 <i>-2.484</i>	0.978	-1.999 <i>-1.707</i>	-0.722 <i>-0.278</i>	-3.215 <i>-2.239</i>	0.705	-1.649 <i>-1.384</i>	-0.116 <i>-0.046</i>	-3.021 <i>-2.048</i>	0.993
<i>LSCALE</i>	-0.353 <i>-11.926</i>	-0.281 <i>-4.553</i>	-0.396 <i>-11.332</i>	2.638	-0.352 <i>-11.995</i>	-0.279 <i>-4.598</i>	-0.394 <i>-11.420</i>	2.702	-0.357 <i>-11.954</i>	-0.280 <i>-4.493</i>	-0.399 <i>-11.361</i>	2.746	-0.350 <i>-11.947</i>	-0.266 <i>-4.490</i>	-0.394 <i>-11.356</i>	3.495
<i>LTRADE</i>	0.162 <i>3.293</i>	0.115 <i>1.130</i>	0.140 <i>2.305</i>	0.047	0.164 <i>3.416</i>	0.111 <i>1.091</i>	0.144 <i>2.398</i>	0.079	0.181 <i>3.713</i>	0.114 <i>1.125</i>	0.172 <i>2.819</i>	0.248	0.166 <i>3.369</i>	0.118 <i>1.157</i>	0.150 <i>2.435</i>	0.071
<i>LGDP</i>	0.228 <i>6.921</i>	0.193 <i>3.506</i>	0.234 <i>5.862</i>	0.369	0.254 <i>7.810</i>	0.192 <i>3.570</i>	0.274 <i>6.981</i>	1.525	0.242 <i>7.368</i>	0.193 <i>3.584</i>	0.251 <i>6.344</i>	0.755	0.288 <i>8.409</i>	0.225 <i>4.041</i>	0.307 <i>7.353</i>	1.358
<i>LINCDIF</i>	-0.489 <i>-4.589</i>	-0.430 <i>-2.031</i>	-0.486 <i>-3.894</i>	0.051												
<i>LVADIF</i>					-0.449 <i>-4.481</i>	-0.549 <i>-2.394</i>	-0.430 <i>-3.743</i>	0.218								
<i>LWAGEDIF</i>									-0.472 <i>-4.526</i>	-0.377 <i>-1.841</i>	-0.497 <i>-4.069</i>	0.255				
<i>LUNITDIF</i>													-0.378 <i>-2.152</i>	-0.541 <i>-1.587</i>	-0.350 <i>-1.603</i>	0.223
<i>R&D-V</i>	4.813 <i>1.589</i>	10.378 <i>1.085</i>	7.040 <i>1.869</i>	0.105	6.214 <i>2.063</i>	12.763 <i>1.304</i>	8.077 <i>2.172</i>	0.200	5.736 <i>1.889</i>	12.551 <i>1.272</i>	7.080 <i>1.905</i>	0.269	5.033 <i>1.627</i>	8.298 <i>0.898</i>	6.839 <i>1.807</i>	0.021
<i>LSCALE-V</i>	0.377 <i>3.881</i>	0.411 <i>2.260</i>	0.384 <i>3.225</i>	0.016	0.381 <i>3.941</i>	0.431 <i>2.366</i>	0.391 <i>3.305</i>	0.034	0.387 <i>4.008</i>	0.410 <i>2.237</i>	0.406 <i>3.433</i>	0.000	0.360 <i>3.756</i>	0.353 <i>1.924</i>	0.372 <i>3.176</i>	0.008
<i>LTRADE-V</i>	-0.462 <i>-2.539</i>	-0.489 <i>-1.098</i>	-0.419 <i>-1.812</i>	0.019	-0.471 <i>-2.719</i>	-0.534 <i>-1.216</i>	-0.437 <i>-1.936</i>	0.039	-0.509 <i>-2.886</i>	-0.502 <i>-1.150</i>	-0.514 <i>-2.222</i>	0.001	-0.449 <i>-2.453</i>	-0.362 <i>-0.823</i>	-0.426 <i>-1.839</i>	0.016
<i>LGDP-V</i>	0.065 <i>2.158</i>	0.065 <i>1.397</i>	0.063 <i>1.635</i>	0.001	0.056 <i>1.895</i>	0.064 <i>1.372</i>	0.054 <i>1.394</i>	0.028	0.065 <i>2.169</i>	0.062 <i>1.292</i>	0.069 <i>1.755</i>	0.013	0.066 <i>2.189</i>	0.039 <i>0.753</i>	0.066 <i>1.708</i>	0.178
<i>LINCDIF-V</i>	0.509 <i>1.821</i>	0.831 <i>2.208</i>	0.267 <i>0.636</i>	0.997												
<i>LVADIF-V</i>					1.057 <i>4.084</i>	1.218 <i>2.959</i>	0.967 <i>2.618</i>	0.207								
<i>LWAGEDIF-V</i>									0.931 <i>3.642</i>	0.946 <i>2.538</i>	0.819 <i>2.163</i>	0.057				
<i>LUNITDIF-V</i>													0.383 <i>0.632</i>	2.161 <i>1.528</i>	0.160 <i>0.221</i>	1.585
Log likelihood	-1190.8	-327.4	-852.7		-1190.9	-325.8	-854.5		-1190.6	-327.7	-852.8		-1200.5	-328.5	-860.5	
Log likel. Ratio test				21.4				21.2				20.2				23.0

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

Table 12:

Tobit Estimates: Horizontally and vertically forward & backward integrated multinationals, differences between periods 1974-1986 and 1990-1994

Specification	(IIIa)				(IIIb)				(IIIc)				(IIId)			
Dependent variable	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-	AFFSH			WALD-
Interaction variable	VFBEU			Statistic	VFBEU			Statistic	VFBEU			Statistic	VFBEU			Statistic
Years	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$	1974-1994	1974-1986	1990-1994	$\chi^2 =$
No. of obs.	1655	829	826		1655	829	826		1655	829	826		1655	829	826	
<i>R&D</i>	-1.643	-0.001	-3.752	0.003	-2.191	-0.206	-4.461	2.562	-1.999	-0.172	-4.203	2.377	-1.649	-0.189	-3.550	1.650
	<i>-1.406</i>	<i>0.000</i>	<i>-1.721</i>		<i>-1.851</i>	<i>-0.139</i>	<i>-2.023</i>		<i>-1.707</i>	<i>-0.116</i>	<i>-1.952</i>		<i>-1.384</i>	<i>-0.129</i>	<i>-1.637</i>	
<i>LSCALE</i>	-0.353	-0.265	-0.469	10.848	-0.352	-0.259	-0.468	11.715	-0.357	-0.265	-0.476	11.509	-0.350	-0.261	-0.474	11.997
	<i>-11.926</i>	<i>-6.791</i>	<i>-9.743</i>		<i>-11.995</i>	<i>-6.785</i>	<i>-9.853</i>		<i>-11.954</i>	<i>-6.750</i>	<i>-9.834</i>		<i>-11.947</i>	<i>-6.773</i>	<i>-9.879</i>	
<i>LTRADE</i>	0.162	0.084	0.196	1.008	0.164	0.083	0.180	0.763	0.181	0.098	0.206	0.951	0.166	0.097	0.191	0.686
	<i>3.293</i>	<i>1.221</i>	<i>2.209</i>		<i>3.416</i>	<i>1.237</i>	<i>2.057</i>		<i>3.713</i>	<i>1.439</i>	<i>2.358</i>		<i>3.369</i>	<i>1.375</i>	<i>2.145</i>	
<i>LGDP</i>	0.228	0.233	0.215	0.072	0.254	0.237	0.268	0.247	0.242	0.237	0.235	0.001	0.288	0.274	0.290	0.060
	<i>6.921</i>	<i>5.521</i>	<i>4.299</i>		<i>7.810</i>	<i>5.698</i>	<i>5.783</i>		<i>7.368</i>	<i>5.639</i>	<i>4.875</i>		<i>8.409</i>	<i>6.240</i>	<i>5.980</i>	
<i>LINCDIF</i>	-0.489	-0.401	-0.545	0.455												
	<i>-4.589</i>	<i>-2.788</i>	<i>-3.452</i>													
<i>LVADIF</i>					-0.449	-0.624	-0.354	1.579								
					<i>-4.481</i>	<i>-3.662</i>	<i>-2.722</i>									
<i>LWAGEDIF</i>									-0.472	-0.451	-0.479	0.018				
									<i>-4.526</i>	<i>-2.898</i>	<i>-3.394</i>					
<i>LUNITDIF</i>													-0.378	-0.518	-0.357	0.205
													<i>-2.152</i>	<i>-1.976</i>	<i>-1.474</i>	
<i>R&D-V</i>	4.813	1.708	11.339	1.448	6.214	2.523	12.526	1.531	5.736	2.501	12.018	1.431	5.033	2.359	12.955	1.736
	<i>1.589</i>	<i>0.456</i>	<i>1.603</i>		<i>2.063</i>	<i>0.677</i>	<i>1.746</i>		<i>1.889</i>	<i>0.665</i>	<i>1.714</i>		<i>1.627</i>	<i>0.635</i>	<i>1.816</i>	
<i>LSCALE-V</i>	0.377	0.312	0.402	0.133	0.381	0.324	0.391	0.075	0.387	0.322	0.415	0.142	0.360	0.312	0.363	0.045
	<i>3.881</i>	<i>2.656</i>	<i>1.868</i>		<i>3.941</i>	<i>2.769</i>	<i>1.832</i>		<i>4.008</i>	<i>2.754</i>	<i>1.930</i>		<i>3.756</i>	<i>2.662</i>	<i>1.721</i>	
<i>LTRADE-V</i>	-0.462	-0.413	-0.165	0.299	-0.471	-0.419	-0.138	0.399	-0.509	-0.451	-0.209	0.295	-0.449	-0.417	-0.026	0.724
	<i>-2.539</i>	<i>-1.555</i>	<i>-0.450</i>		<i>-2.719</i>	<i>-1.640</i>	<i>-0.380</i>		<i>-2.886</i>	<i>-1.723</i>	<i>-0.579</i>		<i>-2.453</i>	<i>-1.524</i>	<i>-0.070</i>	
<i>LGDP-V</i>	0.065	0.055	0.039	0.041	0.056	0.043	0.033	0.016	0.065	0.052	0.043	0.014	0.066	0.047	0.037	0.015
	<i>2.158</i>	<i>1.553</i>	<i>0.567</i>		<i>1.895</i>	<i>1.240</i>	<i>0.473</i>		<i>2.169</i>	<i>1.497</i>	<i>0.618</i>		<i>2.189</i>	<i>1.329</i>	<i>0.553</i>	
<i>LINCDIF-V</i>	0.509	0.420	0.494	0.013												
	<i>1.821</i>	<i>1.218</i>	<i>0.892</i>													
<i>LVADIF-V</i>					1.057	1.428	0.553	2.586								
					<i>4.084</i>	<i>4.031</i>	<i>1.337</i>									
<i>LWAGEDIF-V</i>									0.931	0.922	0.733	0.130				
									<i>3.642</i>	<i>2.917</i>	<i>1.759</i>					
<i>LUNITDIF-V</i>													0.383	1.489	-1.186	3.442
													<i>0.632</i>	<i>1.766</i>	<i>-1.014</i>	
Log likelihood	-1190.8	-602.8	-574.8		-1190.9	-596.9	-577.8		-1190.6	-601.7	-575.0		-1200.5	-605.0	-578.2	
Log likel. Ratio test				26.6				32.4				27.8				34.6

T-statistic in *italics*. Time fixed effects are included. Estimates are heteroscedasticity consistent. The suffix -V indicates the inclusion of a vertical interaction term.

8. References:

- Andersson, Thomas, and Fredriksson, Torbjörn (1993): Sveriges Val, EG och Direktinvesteringar, Bilaga 7 till EG-Konsekvensutredningen, Samhällssekonomi, (Stockholm: IUI)
- Andersson, Thomas, Fredriksson, Torbjörn and Svensson, Roger (1996): Multinational Restructuring, Internationalization and Small Economies: The Swedish Case, (London: Routledge)
- Aristotelous, Kyriacos and Fountas, Stilianos (1996): An Empirical Analysis of Inward Foreign Direct Investment Flows in the EU with Emphasis on the Market Enlargement Hypothesis, in *Journal of Common Market Studies*, Vol. 34, pp. 571-583
- Baldwin, Richard (1989): Growth Effects of 1992, in *Economic Policy*, Vol. 9, pp. 247-282
- Baldwin, Richard, Forslid, Rikard, and Haaland, Jan (1995): Investment Creation and Diversion: A Simulation Analysis of the Single Market Programme, NEBR Working Paper Series, No. 5364
- Blomström, Magnus and Kokko, Ari (1994): Home Country Effects of Foreign Direct Investment: Sweden, pp. 341-364, in Globerman, Steven (Ed.): *Canadian-Based Multinationals*, Industry Canada Research Series, Vol. 4, (Calgary: Calgary University Press)
- Blomström, Magnus and Kokko, Ari (1997): Foreign Direct Investment and Politics: The Swedish Model, pp. 359-376, in Dunning, John (Ed.): *Governments, Globalization, and International Business*, (New York: Oxford University Press)
- Blomström, Magnus, Lipsey, Robert E. and Kulchycky, Ksenia (1988): U.S. and Swedish Direct Investments and Exports, in Baldwin, R. (Ed.): *Trade Policy Issues and Empirical Analysis*, (Chicago: Chicago University Press)
- Brainard, Lael. S. (1993): A Simple Theory of Multinational Corporations and Trade with Trade-Off Between Proximity and Concentration, in *NBER Working Papers Series*, No. 4269
- Braunerhjelm, Pontus and Ekholm Karolina (Eds.): *The Geography of Multinational Firms*, (Boston: Kluwer Academic)
- Braunerhjelm, Pontus, Ekholm, Karolina, Grundberg, Lennart and Karpaty, Patrik (1996): *Swedish Multinational Corporations: Recent Trends in Foreign Activities*, The industrial Institute for Economic and Social Research, Working Paper, No. 462
- Davies, Stephen W. and Lyons, Bruce R. (Eds.) (1996): *Industrial Organisation in the European Union: Structure, Strategy, and the Competitive Mechanism*, (Oxford: Clarendon Press)
- Dunning, John H. (1997a): The European Internal Market Programme and Inbound Foreign Direct Investment, Part I, in *Journal of Common Market Studies*, Vol. 35, No. 1, pp. 1-30
- Dunning, John H. (1997b): The European Internal Market Programme and Inbound Foreign Direct Investment, Part II, in *Journal of Common Market Studies*, Vol. 35, No. 2, pp.

189-222

- Emerson, Michael, Catinat, Michel, Goybet, Philippe and Jacquemin, Alexis (1988): *The Economics of 1992; The E.C. Commission's Assessment of the Economic Effects of Completing the Internal Market*, (Oxford: Oxford University Press)
- European Commission (1996): *European Economy, Economic Evaluations of the Internal Market*, No. 4, (Luxembourg: Office for Official Publications of the European Communities)
- European Commission (1997): *The Single European Market Review: External Access to European Markets: Impact on Trade and Investment*, (Luxembourg: Office for Official Publications of the European Communities)
- Eurostat (1995): *European Union Direct Investments 1984:93*, (Luxembourg: Office for Official Publications of the European Communities)
- Greene, William (1993): *Econometric Analysis*, 2nd edition, (New York: Macmillan)
- Lindbeck, Assar, Molander, Per, Persson, Torsten, Petersson, Olof, Sandmo, Agnar, Swedenborg, Brigitta, Thygesen, Niels (1994): *Turning Sweden Around*, (Cambridge Mass.: MIT Press)
- Maddala, G. S. (1983): *Limited-Dependent and Qualitative Variables in Econometrics*, (Cambridge: Cambridge University Press)
- Markusen, James R. (1995): *The Boundaries of Multinational Enterprises and the Theory of International Trade*, in *Journal of Economic Perspectives*, Vol. 9, No. 2, pp. 169-189
- Markusen, James R. (1997): *Trade Versus Investment Liberalization*, NBER Working Papers Series, No. 6231
- Markusen, James R. and Venables Anthony J. (1996a): *The Increased Importance of Direct Investment in North Atlantic Economic Relationships: A Convergence Hypothesis*, pp. 169-189, in Canzoneri, Matthew B., Ethier, Wilfred J. and Grilli, Vittorio (Eds.) *The New Transatlantic Economy*, (Cambridge: Cambridge University Press)
- Markusen, James R. and Venables Anthony J. (1996b): *The Theory of Endowment, Intra-industry, and Multinational Trade*, NBER Working Papers Series, No. 5529
- Markusen, James R. and Venables Anthony J. (1998): *Multinational Firms and New Trade Theory*, in *Journal International Economics*, Vol. 46, pp. 183-203
- Markusen, James R., Venables, Anthony J., Konan; Denise Eby and Zhang, Kevin H. (1996): *A Unified Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services*, NBER Working Paper Series, No. 5696
- Mathä, Thomas (2000): *Proximity-Concentration versus Factor Proportion Explanation: The Case of Swedish Multinationals in the EU*, SSE/EFI Working Paper Series, No. 416, Stockholm School of Economics, The Economic Research Institute, <http://swopec.hhs.se/hastef/abs/hastef0416.htm>
- Norbäck, Pehr-Johan (1998): *Multinational Firms, Technology and Location*, Dissertations In Economics, 1998:2, Department of Economics, Stockholm University, (Edsbruk: Akademitryck)

- OECD (1996): International Direct Investment Statistics Yearbook 1996, (Paris: OECD)
- OECD (1997a): National Accounts, Main Aggregates, Volume 1, 1960-1995, (Paris: OECD)
- OECD (1997b): The OECD Stan Database for Industrial Analysis, 1976-1995, (Paris: OECD)
- Statistics Sweden (1999): Statistical Yearbook of Sweden 2000, (Stockholm: Norstedt Tryckeri)
- Svensson, Roger (1996): Effects of Overseas Production on Home Country Exports: Evidence Based on Swedish Multinationals, in *Weltwirtschaftliches Archiv*, Vol. 132, No. 2, pp. 304-329
- Swedenborg, Birgitta, (1979): The Multinational Operations of Swedish Firms: An Analysis of Determinants and Effects, (Stockholm: Almquist & Wicksell)
- Swedenborg, Birgitta, (1982): *Svensk Industri i Utlandet: En Analys av Drivkrafter och Effekter*, (Stockholm, The Industrial Institute of Economic and Social Research)
- Swedenborg, Brigitta (1985): Sweden, pp. 217-248, in Dunning, John H. (Ed.): *Multinational Enterprises, Economic Structure and International Competitiveness*, IRM Series on Multinationals, (Chichester: Wiley)
- UNCTAD (1993): *From the Common Market to EC 92: Regional Economic Integration in the European Community and Transnational Corporations*, Transnational Corporations and Management Division, Department of Economics and Social Development, (New York: United Nations)
- UNCTAD (1997): *World Investment Report: Transnational Corporations, Market Structure and Competition Policy*, (United Nations: New York)