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THE EC AND THE LOCATIONAL CHOICE OF SWEDISH MULTINATIONAL COMPANIES

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Content

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ABSTRACT

In a world with multinational companies (MNC's) changes such as those implied by the realization of EC's internal market will affect the locational choice made by geographically mobile MNC's. The reason is that the reduction of trade barriers within the EC puts non–EC members at a competitive disadvantage relative to EC members, thereby increasing the incentive to produce within the common market. This is true even though there may be no absolute increase in trade barriers for non–members.

This (highly preliminary) paper suggests how the effects of the internal market on the location of production can be analyzed in a partial equilibrium framework of a firm serving many national markets and able to produce in different countries. It uses unique survey data on Swedish MNC production and trade for the period 1965–86 and draws on previous analysis of the earlier part of that data to indicate how important these effects may be empirically.

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THE EC AND THE LOCATIONAL CHOICE OF SWEDISH MULTINATIONAL COMPANIES

The completion of the EC internal market by 1992 can be expected to affect non-EC members – like Sweden – as well. Some, like Krugman (1988), argue that other European countries will actually be made worse off as a result of the internal market. The reason is that the ECs discriminatory reduction of trade barriers, and the consequent improved efficiency of EC producers, will divert some of today's exports to the EC from non-member countries.

The purpose of this (highly preliminary) paper is to look at how the effects on a non-member country like Sweden are modified when we allow for foreign production by national firms. Any change that affects exports is also likely to affect the locational choice of geographically mobile multinational companies. There are two questions involved. First, will the internal market lead to increased production in the EC by Swedish MNCs? And, if so, by how much? Second, would such an increase in production – ceteris paribus – lead to a larger or smaller decline in Swedish exports compared to the alternative when foreign production had not been an option (e.g., because of controls)? Data on the foreign operations of Swedish multinational companies (from the IUI surveys of Swedish direct investment) will be used in the empirical analysis.

1. The Internal Market and Non-EC Members

What are the proposed changes and how will they affect Sweden? The aim of the internal market is to eliminate remaining barriers to trade in goods and services between the EC countries. The program includes elimination of border controls, of divergent technical standards for products, of discriminatory public procurement practices and regulations of different service sectors.

None of the proposed changes (necessarily) implies higher barriers to trade for non-members in absolute terms. Some even imply lower trade barriers for non-members as well. But most imply larger reductions in trading costs for EC members than for non-members and therefore a competitive disadvantage in EC trade for non-members relative to member countries. This will cause trade diversion in that some of the increased trade within the EC will be at the expense of trade with outsiders. In addition, some measures will lead (directly or indirectly) to lower costs of production in the EC and improved competitiveness of EC producers, regardless of where the output is sold.

Not only do the different measures have different effects but both the direct and indirect effects are complex and difficult to evaluate. For example, the elimination of border controls between the EC countries will benefit EC trade but it will also benefit Swedish transit trade in the EC. Swedish exports will only have to pass through customs once, i.e., upon entry into the EC. On the other hand, the most important effect of the removal of border obstacles is not expected to be the direct resource saving (administrative handling, waiting time at the border, etc) but the increase in cross-border competition. The latter will not affect producers outside the EC market, who are shielded from such competition by border obstacles.

It is outside the scope of the present paper to evaluate the effects of the internal market on non-EC exports. In what follows I will assume that the evaluation of the internal market made by the EC commission for the EC countries is valid. I will also assume that 1) there is a discriminatory effect on non-members but 2) it is not as large as the beneficial effect on member countries. Furthermore, the effects are both on the cost of trade and on the productive efficiency of EC producers.

2. Determinants of the Location of Production by Firms

How will this affect the pattern of production and trade? The location of production and the pattern of trade are determined simultaneously and by the same set of factors. According to the classical theory of comparative advantage both are determined by differences in relative factor prices, which,

in turn, are determined by differences in relative factor endowments, between countries. However, the theory of comparative advantage cannot explain why a considerable part of international trade occurs between countries with similar relative factor endowments and factor prices – like, for example, the European countries. Instead, empirical observation suggests that much trade between the industrial countries is not determined by comparative advantage but by cost differences based on an arbitrary, historically determined specialization and the consequent differential attainment of scale economies. Modern trade theory therefore stresses the role of scale economies and, its corollary, imperfect competition as bases for trade. This has considerable implications in the context of 1992: If scale economies are more important than comparative advantage as a basis for initial specialization, the enlargement of the EC market can be expected to have much larger effects on the location – and relocation – of production.

Modern trade theory implies that the gains from trade can be much larger and points to three main reasons why countries gain from international trade. The first is the ability to specialize in accordance with their comparative advantage. The second is the ability to exploit economies of scale. The third is that the opening up of borders increases competition.

The extent to which the pattern of trade is determined by importantly advantage and scale economies respectively makes a difference in evaluating the potential effects of "1992". When scale economies are important the size of the market decisively affects what cost advantages can be achieved and the enlargement of the EC market can have much larger effects on efficiency and incomes. This may or may not affect the location of actual manufacturing, depending on whether scale economies apply to plants or to firms. This is an important empirical question, which – I believe – has not been resolved.

Scale economies at the plant level would lead to production being concentrated in one or a few large plants. These will tend to be located in the countries with the largest home markets, since the firm can thereby avoid tariffs and other trading costs in its largest markets. Scale economies at the firm level, on the other hand, affects the size of the firm but does not affect the location of production. It is a firm-specific asset that can be exploited by

the firm regardless of where production is located. It is compatible with multi-plant production and with "foot–loose" MNCs producing in many countries. If scale economies at the firm level is all that matters, the location of production is indeterminate.

In earlier work on the determinants and effects of foreign production by firms I have used a simple model of a profit-maximizing, single product firm serving many national markets and having the option of producing in either. (See Swedenborg, 1979, and the attached figure.) Some characteristics of this model are the following. The firm must be a monopolistic competitor (face a negatively sloped demand curve) in order for there to be determinate levels of sales in more than one country. There must be decreasing returns to scale (marginal cost must be rising) in order for the firm to produce the same output in more than one country. MNC production, then, requires either 1) decreasing returns to scale (at the plant level), 2) that different products are produced in different countries or 3) the existence of offsetting trade barriers.

In the model used an increase in tariffs or a downward shift in the cost of foreign production will lead to an increase in foreign production and a decrease in exports.

The effect, moreover, of allowing foreign production (regarding the latter as a government policy variable) is a larger decline in exports of the same product from the home country than otherwise would have been the case (from (S_X to S_X in the figure). For the multi-product firm the overall effect is uncertain a priori and depends on the relative strength of substitution and complementarity effects. If, for example, the firm's other exports are mostly complementary to foreign production, the net effect may be that exports decline less as a result of an increase in foreign production than otherwise would have been the case. (See App. A in Swedenborg, ibid.)

3. The Internal Market and Swedish Multinationals

The foregoing suggests that the internal market may have the following, partial equilibrium effects on Swedish multinational companies:

1) Reduced fragmentation within the EC (esp. with regard to public procurement and technical standards) makes possible increased specialization and exploitation of scale economies by subsidiaries within the EC. It also leads to increased efficiency through intensified competition.

2) Lower production costs in the EC (due to lower trade barriers, lower costs of intermediary services, increased economies of scale, etc) will induce Swedish firms to supply the EC through local production rather than through exports from Sweden. The larger the cost advantage for EC producers, the larger this effect will be.

3) If and when the EC market is more important than the Swedish market – and if scale economies (at the plant level) are more important than comparative advantage as a basis for trade – Swedish firms could find it more profitable to locate their entire production in the EC and supply the Swedish market through exports. However, this point (made by Krugman, ibid) assumes that scale economies in production can, as it were, "be picked up and moved" from one country to another. That is inconsistent with the proposition that cost differences between countries due to scale economies are historically determined.

In general equilibrium one would have to take into account the effects of these (and other)changes on Sweden's and the ECs terms of trade. If the shift away from production in Sweden and towards production in the EC is strong, this will induce a real depreciation in Sweden to counter this effect and restore balance in Sweden's international payments.

4. Some Empirical Magnitudes

How important are these potential effects empirically? The first thing to note is that Swedish MNCs (defined as firms which have manufacturing affiliates abroad) loom large in Swedish industry. They account for some 50% of manufacturing employment in Sweden and almost 60% of Swedish exports.

Second, they are highly internationalized. In 1986, less than 1/4 of their total sales were sold in the home market. Of the 3/4 sold in foreign markets well over half was produced abroad.

Third, the EC is by far the single most important market for Swedish industry. It accounts for about half of both total Swedish exports and total foreign production. For Swedish MNC's it is, in fact, much larger than the Swedish home market (38% compared to 24% of total MNC sales).

Potentially, then, a large part of Swedish industry is involved and the effects may be substantial.

Can we say anything about the relative importance of factor proportions and scale economies as determinants of the location of production and as a basis for trade? About trade barriers and the size of the market? Here, again, I must refer to earlier analyses of these questions (Swedenborg, 1982), from which the attached tables are taken (tables 1 and 2).

In the first table (1) the propensity to export and the propensity to produce abroad by Swedish MNCs are related to traditional factor proportions variables such as R&D intensity, labor skill intensity, physical capital intensity, natural resource dependence and more "modern" variables such as scale economies in production and the age of the firm (actually of its foreign operations). The factor proportions variables are firm characteristics which, in the factor proportions theory, would form a basis for a comparative advantage to Sweden and translate into an absolute advantage to firms located in Sweden. One of them, namely, R&D intensity, forms the basis for a firm-specific rather than a country-specific advantage in that the results of R&D can be utilized by the firm regardless of where actual manufacturing is located.

The second table (2) adds the influence of country characteristics such as the size of the market and income per capita (highly correlated with the ratio of foreign to home wages).

The results suggest the following. R&D intensity and skill intensity, which are parent company characteristics, have a positive effect on both the relative size of exports and foreign production. This is consistent both with a factor proportions theory of trade and with one based on scale economies at the firm level, since the latter is often related to R&D and "know–how". Dependence on domestic natural resources (steel, forestry) makes for exporting rather than foreign production. Physical capital intensity and scale economies at the plant level, on the other hand, have no effect on exports once resource dependence has been allowed for, the reason being that the resource intensive industries are also characterized by high capital intensity and large scale economies. Scale economies do influence the propensity to produce abroad negatively, however.

The very significant influence of the age variable is interesting since it suggests that the size of a firm depends on historical factors, i.e., when it was first established. Time may play a role either because, quite simply, it takes time to grow large, or because time is associated with the accumulation of learning-by-doing.

Overall the results suggest that both comparative advantage and scale economies, especially at the firm level, play a role in determining the export performance and general competitiveness of firms.

The size of the market affects not only the volume of sales in a country but also leads, interestingly enough, to a higher propensity to supply the market through local production. This can only be explained in combination with scale economies and trade barriers: The larger the market, the greater the potential for exploiting economies of scale in production. Scale economies at the plant level, then, seems to have an effect on the location of production. The income per capita (and relative wage) variable shows that Swedish firms tend to both sell and produce in relatively high income countries, i.e., in countries similar to Sweden in relative factor endowment and factor prices.

In sum, this earlier analysis suggests that the kind of changes implied by the internal market may have significant effects on the locational choice made by Swedish MNCs. The enlargement of the market and the preferential treatment of EC producers should combine to make foreign production a more profitable alternative than exports.

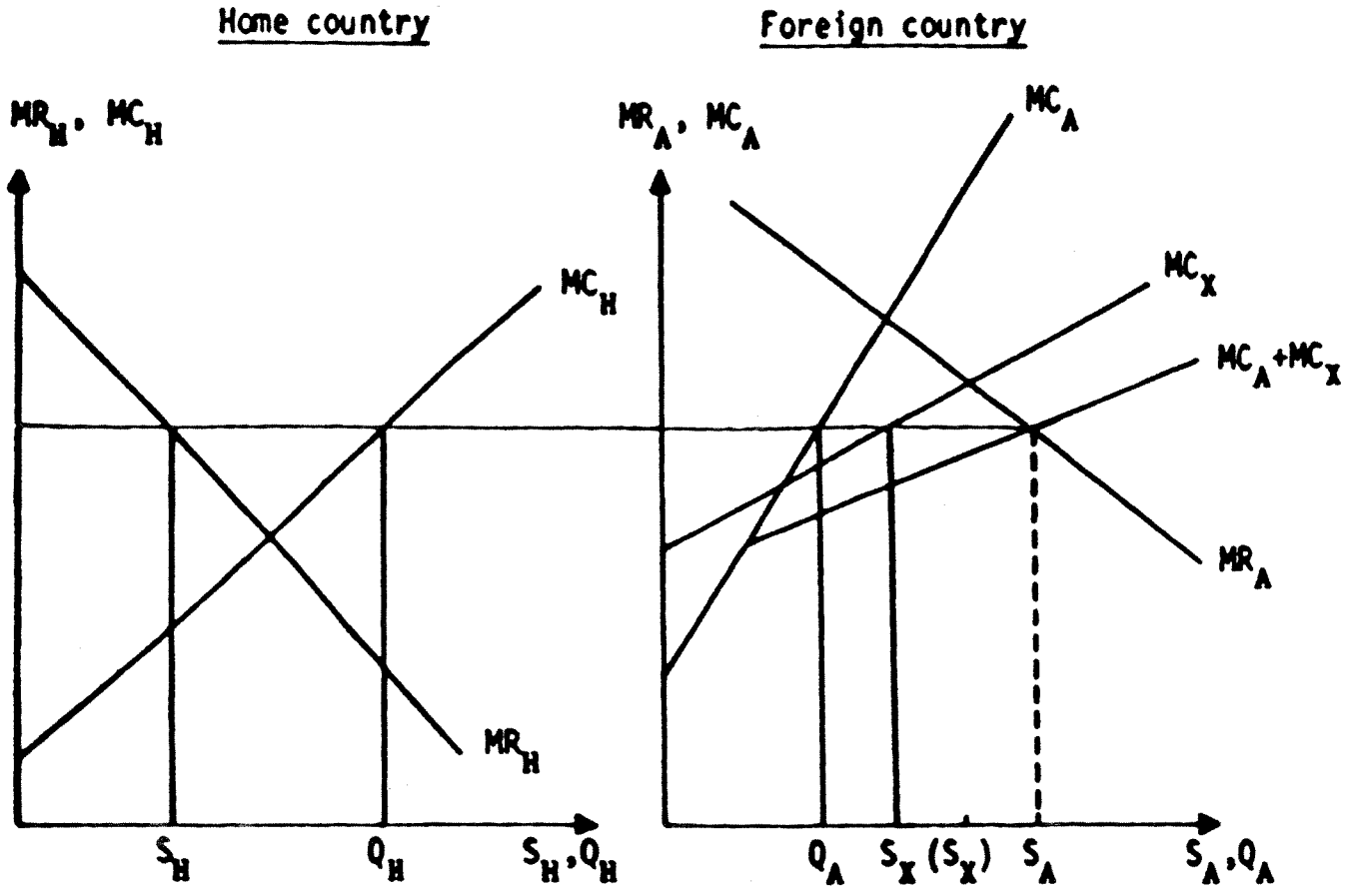
How large this substitution of foreign production for exports will be is a matter for further analysis. However, it is interesting to note what happened in response to EC integration in the 1960's and 1970's. (See Table 3, Foreign production relative to total sales abroad by Swedish firms 1965–86.) The **share** of total sales supplied through local production rose significantly in the EC in the 1960's. As Britain and Denmark joined the EC in the 1970's we observe the same phenomenon in those countries (1974–78). And the extremely rapid increase of production relative to exports in the U.S. in the period 1978–86 can perhaps be interpreted in the same terms: As the huge U.S. market was opened up to foreign competition (due to the high value of the dollar) in that period, production by Swedish firms increased even more rapidly than Swedish exports. The only explanation I can offer for this is that the potential to attain scale economies and reduce trading costs (in a wide sense) in the large and rapidly growing U.S. market far outweighed the cost disadvantage due to an "overvalued" (in purchasing–power–parity terms) dollar.

Thus, what we can look forward to as a result of 1992 **may** be a substitution of foreign production for exports on a scale similar to what we observed in the EC in the 1960's and in the U.S. in the 1980's: production in the EC relative to total sales in the EC would then rise from the present 46% level to some 60% or more in the next decade. That, in turn, would imply a very slow growth of total Swedish exports (half of which goes to the EC).

Finally, how would such an increase in foreign production affect Swedish exports compared to the alternative that increased foreign production had not been allowed? The answer determines whether the effects on Swedish exports of the internal market are modified when we take into account foreign production by Swedish firms.

Earlier analysis suggests that Swedish exports were, if anything, larger as a result of foreign production, since the positive effect on complementary exports outweighed the negative effect on substitute exports. But the effects were small, indicating that foreign production by Swedish firms have a small effect on price in foreign markets. This implies that, even though the explanation of multinational production must be sought in the theory of imperfect competition, foreign markets, in fact, form a highly competitive environment for Swedish multinational companies. In the absence of foreign production by Swedish firms similar production would have been undertaken by other firms and this would have had similar effects on Swedish exports.

Figure 1 Determination of the firm's sales and output in two countries



The conditions for profit maximization are:

$MC_H = MR_H$

$MC_A = MR_A$

$MR_H = MR_A$

Table 1 Determinants of foreign sales and foreign production. Cross-sections over companies 1978[a]

Independent variables	Constant	Dependent variables RD	LS	KL	NR	SC	YR	DF	R^2	F
$\frac{(S_X+S_Q)}{S_H}$	–6.23**	0.30**	1.80	–0.05	1.50**	–0.12	0.75**	105	0.42	12.88**
	(–2.49)	(3.94)	(3.21)**		(3.21)	(–1.04)	(2.53)			
$\frac{S_X}{S_H}$	–1.98	0.43**	0.85	–0.15	2.49**	–0.02	0.18	107	0.37	10.35**
		(4.99)	(1.33)	(–1.00)	(4.58)					
$\frac{S_Q}{S_H}$	–6.80**	0.26**	1.75**	–0.21	0.70	–0.22	1.52**	99	0.39	10.38**
	(–2.09)	(2.92)	(2.40)	(–1.31)	(1.31)	(–1.63)	(4.45)			
$\frac{Q_A}{Q_H}$	–6.25**	0.01	1.23**	–0.12	–0.38	–0.26**	1.69**	105	0.34	9.07**
	(–2.53)		(2.24)			(–2.25)	(5.79)			

[a] The variables are in logarithmic form.

$\frac{(S_X+S_Q)}{S_H}$ = foreign sales/domestic sales

S_X/S_H = exports/domestic sales

S_Q/S_H = affiliate net local sales/domestic sales

Q_A/Q_H = affiliate net sales/domestic sales

RD = R&D-sales ratio

LS = labor-skill measure

KL = capital-labor ratio

NR = dummy variable for paper and pulp and iron and steel industries

SC = average plant size

YR = age of foreign manufacturing

Table 2 **Determinants of foreign sales and foreign production in different countries. Cross-sections over companies and countries 1978**

Dependent variables	Constant	Independent variables											
		RD	LS	KL	NR	SC	GDP	GDP_{cap}	W_j/W_H	VR	DF	R^2	F
$\frac{(S_X+S_Q)}{S_H}$	−4.39**	0.14**	0.91	−0.08	1.83**	−0.23**	0.29**	−0.05	0.50**	0.52**	321	0.23	10.50**
	(−1.59)	(2.17)	(1.60)		(5.11)	(−2.62)	(4.79)		(2.21)	(2.53)			
$\frac{S_X}{S_H}$	−8.86**	0.39**	0.13	−0.26	2.83**	0.03	0.15**	0.72**	0.04	−0.01	322	0.25	12.19**
	(−2.64)	(5.18)		(−1.43)	(6.20)		(1.99)	(3.64)					
$\frac{S_Q}{S_H}$	−0.23	−0.05	0.43	−0.01	1.22**	−0.36**	0.41**	−0.38**	0.82**	0.84**	346	0.23	11.31**
					(3.17)	(−3.81)	(6.08)	(−2.29)	(3.32)	(3.79)			
$\frac{Q_A}{Q_H}$	−1.31	−0.15**	0.21	0.09	0.28	−0.48**	0.26**	−0.02	0.55**	0.86**	358	0.25	13.54**
		(−2.37)				(5.67)	(4.47)		(2.62)	(4.38)			

[a] The variables are in logarithmic form.

GDP = "market size"
GDP/cap = "income per capita"
W_j/W_H = relative wages abroad to at home

Numbers in parentheses are t-statistics; $t < 1$ not shown. ** indicate significance at the .10 and .5 level respectively.

Table 3 **Foreign production relative to total sales abroad by Swedish firms 1965–86**
Percent

	1965	1970	1974	1978	1986
EG 6	**35**	**42**	43	47	46
EG 3	14	15	**14**	**22**	24
EFTA	14	14	12	16	18
USA	47	36	37	**46**	**58**
All countries	27	29	28	34	38

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