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No. 69, 1982

Relative Competitiveness of Foreign Subsidiary Operations of a Multinational Company 1962-77

by

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RELATIVE COMPETITIVENESS OF FOREIGN SUBSIDIARY OPERATIONS OF A MULTINATIONAL COMPANY 1962-77

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Questions referring to the production strategy, choice of technique and productivity of multinational companies are of growing concern today since they relate to the role of multinational companies in the international division of labor. The importance of these questions is, however, not reflected in the possibilities of answering them. The reason for this is generally that data on multinational plants on a worldwide basis are hard to get, let alone make comparable.

In this paper unique data over costs, productivities and prices of a multinational company and all its European subsidiaries are analyzed in one context, relating both to the internal competitiveness of the individual plants, the international competitiveness of its various production units and to the overall performance of the company. Conceptually we regard relative real rates of return on capital as a useful indication of relative international competitiveness (Eliasson 1972) and attempt to device a method to measure that. The paper is primarily descriptive, but some general hypotheses are implicitly tested.

The company

The company studied produces a product in different variants in many places around the world. Production is, however, concentrat-

ed to Western Europe, to Italy, France, Western Germany, England and Sweden. Since the products are similar, production can be measured by using a simple and reliable weighting procedure. This system is used by the company and involves the measuring of production in terms of a standard cost.[1]

Table 1 Distribution of manufacturing costs[a]

	%
Labor costs	50
Materials	32
Goods and services	11
Capital costs	7
Total	100

a Excluding marketing and distribution costs and profits.

Table 1 gives a breakdown of costs. Labor costs make up the largest share of total costs, constituting about 50 percent of total manufacturing costs and 90 percent of value added. Production is labor-intensive. Also 80 percent of the payroll goes to blue-collar workers, implying that product is not technology-intensive. In fact, the production competes on a world-market basis and can be viewed as "mature" both in a technical and in a market penetration sense. Production costs are therefore crucial for competitiveness.

Production costs and productivity

Since labor costs dominate we shall concentrate on them. This does not imply that materials or capital costs lack in impor-

tance. Detailed analyses of the cost-saving measures undertaken by the company in fact show that by fine-tuning machines, increasing performance of cutting tools, etc., great efforts are made to reduce material inputs as well as capital equipment.

Since the five plants produce the same output it would be natural to assume that their production techniques, and hence labor productivity are alike. Considering the ease with which technology, at least capital embodied technology, is transferred today over countries and continents by independent firms, let alone international companies, we whould expect any technological gaps to shrink over time within the firm.

A glance at the figures in table 2 shows that differences in labor productivity have not diminished. The spread of productivity among the units was very large in all years. In 1970, the middle year of our sample, the highest labor productivity (Sweden) was over 60 percent above that in the plant with the lowest labor productivity (England). Furthermore, this spread has increased over time from 54 percent in 1962 to 130 percent in 1977. (In 1977 the West German plant thus had 130 percent higher labor productivity than the English plant.) Even if the English plant is excluded from the sample an increase in spread occurred from 42 percent in 1962 to 61 percent in 1977.

What factors lie behind the observed spread in productivity and its increase? It appears unreasonable to believe that the company's management, because of ignorance or lack of interest, would permit such large productivity gaps if they could be avoided. They must be rationally determined in some sense.

Table 2 Labor-productivity 1962, 1970 and 1977
(Index for Swedish plant in 1962 = 100)

Plant	1962	1970	1977
Sweden	100	160	216
W. Germany	70	143	243
France	85	143	151
England	65	98	105
Italy[a]	-	105	189
Ratio highest/lowest	1.54	1.63	2.31
Ratio highest/lowest (excl. England)	1.42	1.52	1.61

[a] No production in Italy in 1962.

A simple explanatory model

One answer is that assuming profit maximizing behavior, management tries to minimize production costs rather than maximize labor productivity. The argument can be clarified with the help of figure 1.

A simplifying but reasonable assumption is that capital price is similar between the units in Europe whereas wages differ. Essentially this means that interest and depreciation charges per "unit" of capital are assumed to be the same in the long run.[2] With this assumption, relative prices between labor and capital are determined solely by the wage levels in each country. If there is a technical substitutability between capital and labor it should there-

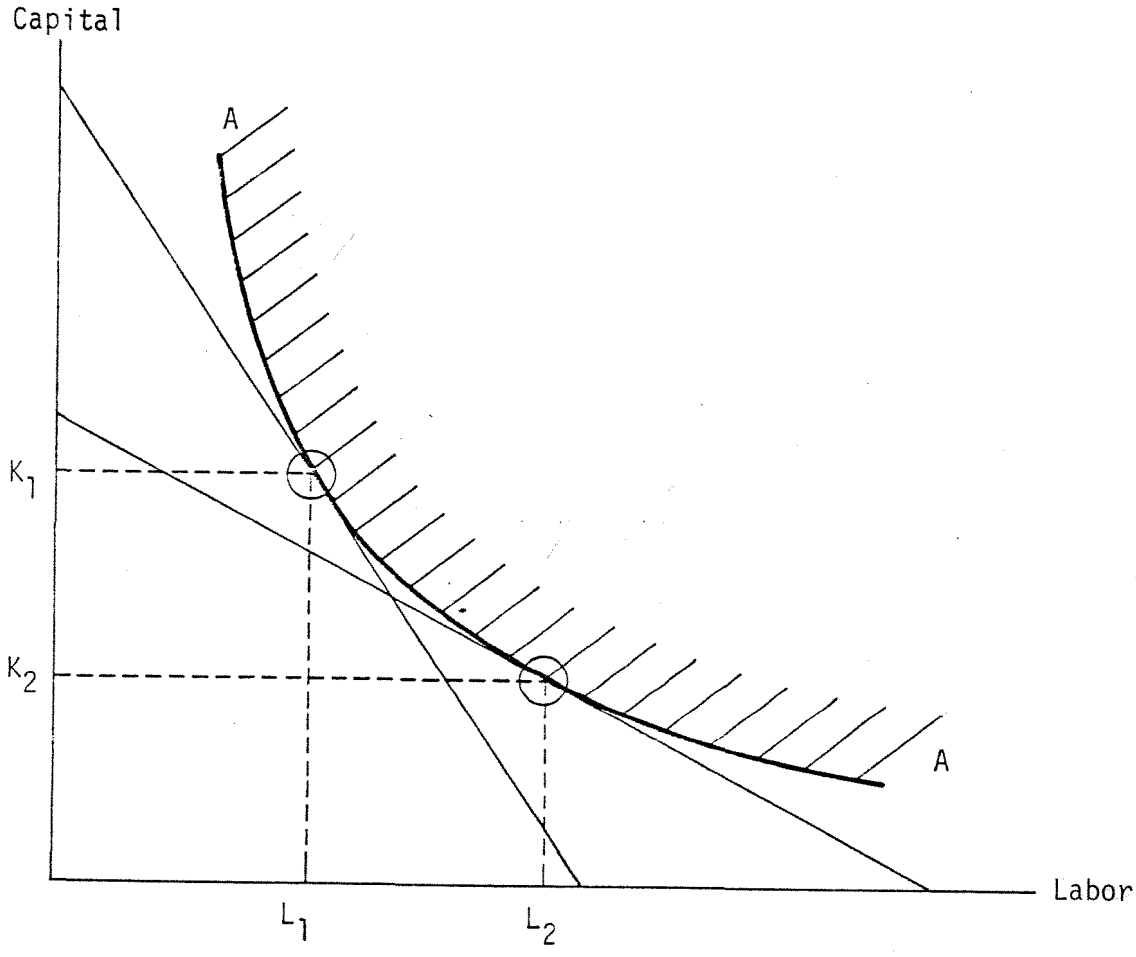
fore be possible to observe a positive relationship between labor productivity and wage level (relative price of labor), and consequently an increase in the labor productivity spread as a response to increases in wage differentials.[3] In figure 2 a clear relationship of this kind between wages and labor productivity appears for 1977. The same pattern appears for the other years as well.[4]

Reduced cost spread after 1970

The ratio between wages and labor productivity constitutes the unit labor cost. How these costs have changed over the period 1962-77 is seen in table 3.

The spread in unit costs is not as large as the labor productivity spread and furthermore it decreases after 1970. This is in harmony with the assumption of cost-minimizing and cost-equalizing management behavior. This argument can be qualified further if the parent company's role as a "technology-central" for all plants could be analyzed. This is, however, not possible yet. In any case, it can be noted that the diminishing spread in costs could be attributed to the concentration of management power which has taken place after 1970 and that has been induced and reinforced since the EEC common market agreement came into effect.

Figure 1 Principal relationship between factor intensities and relative factor prices, given technology



Note: Assume that a number of technical combinations between capital and labor exist or can be developed relatively costlessly in order to produce a number of products. The technically most efficient combinations at a given overall state of technology are represented in the diagram by the curve A-A. With different sets of relative-prices between capital and labor it is shown with two examples that unit labor and capital inputs will differ. If wage levels are high in relation to capital prices the company will choose the factor combination L1-K1. In the opposite case the factor combination L2-K2 will be chosen, that is, less capital and more labor per unit or production. (The technique-curve can also be looked upon as a unit isoquant.) Depending upon the shape of the curve, unit costs will vary in response to different relative price combinations.

Figure 2 Relative price of labor and productivity in five subsidiaries 1977

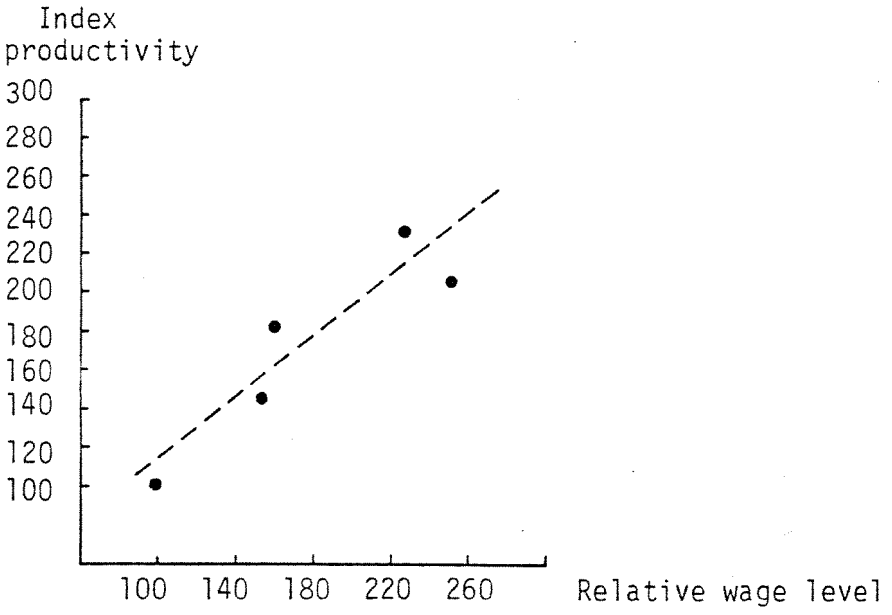


Table 3 Unit labor costs and their relative change 1962-1977 in five factories in Sweden, England, Western Germany, France and Italy (Thousand kr/unit)

	Unit costs					Relative change		
	1962	1967	1970	1974	1977	1974-1977	1970-1977	1967-1977
Sweden	1,90	2,14	2,50	3,54	4,74	1,3	1,9	2,2
England	2,00	2,15	2,24	3,39	3,88	1,1	1,4	1,8
France	1,55	1,53	1,62	2,34	4,15	1,3	2,6	2,7
W. Germany	2,14	2,05	2,28	3,27	3,86	1,2	1,7	1,9
Italy	..	1,74	2,38	2,36	3,43	1,5	1,4	2,1
Ratio highest/lowest	1,38	1,40	1,54	1,51	1,38			
Sweden/average for other countries	1,0	1,2	1,2	1,4	1,3			

Competitiveness of production units

The development of (average) wages, productivity and costs is seen more clearly, and in one context in figures 3 and 4. Along the x-axis is the wage level in nominal terms, in kr/h; along the y-axis is labor productivity, in units/hour. Both axes are expressed in logarithmic form so that points with the same unit costs form straight lines with 45° inclination. The upper (leftmost) line refers to a lower unit cost than the lower (rightmost). The company tries to produce as close to the upper 45° line as possible, in order to minimize unit costs. For the years 1962, 1967, 1970, 1974 and 1977 labor costs and productivity have been plotted for each plant. The irregular polygons are made up by uniting observations for each year. The polygons have shifted in a north-eastern direction in the diagram over time, which reflects both the increase in productivity and the increase in nominal wages that has taken place.

Since Sweden has had the highest wage cost level every year its observations are the rightmost for each year. Every year, except the last (1977), the Swedish plant has also had the highest labor productivity. The new factor in the 1977 situation is therefore not the high Swedish wage level, but the fact that it does not coincide with the highest productivity level. The previously discussed increase in the relative wage and productivity spread is seen by the measure in the width of the polygons along the x-axis (wage spread) and along the y-axis (productivity spread) between 1962 and 1977. The relative spread in costs appears from the width of the polygons measured perpendicularly to the 45°-cost lines. The reduction in cost spread for 1977 as compared to e.g. 1974 appears clearly (also see table 3).

According to table 3 as well as to figure 3 unit costs have increased for all production units, and not only for the Swedish plant. Between 1962 and 1967 this average increase was insignificant, but, as can be seen from the parabolic form of the "average-curve" in figure 3, it has increased at an accelerating rate. The fact that costs have increased in all plants is a problem for the company as a whole rather than for its parts.

Figure 3 Relation between productivity, wage level and unit labor cost for five subsidiaries in European countries 1962-77

(Double logaritmic scales)

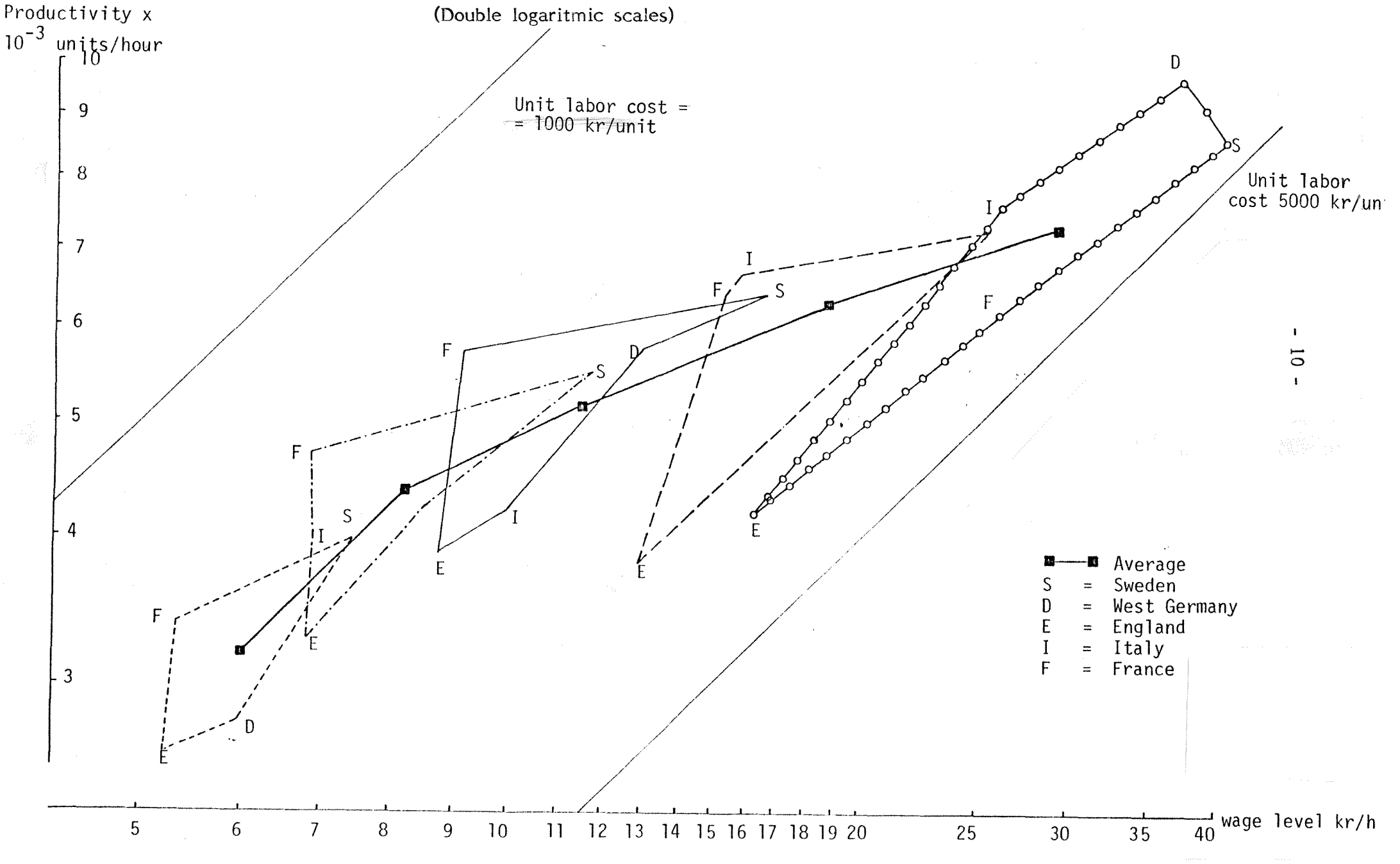


Figure 4 Relation between productivity, wage level and unit labor cost in one concern in European countries 1962-77. Countrywise subsidiaries

(Double logarithmic scales)

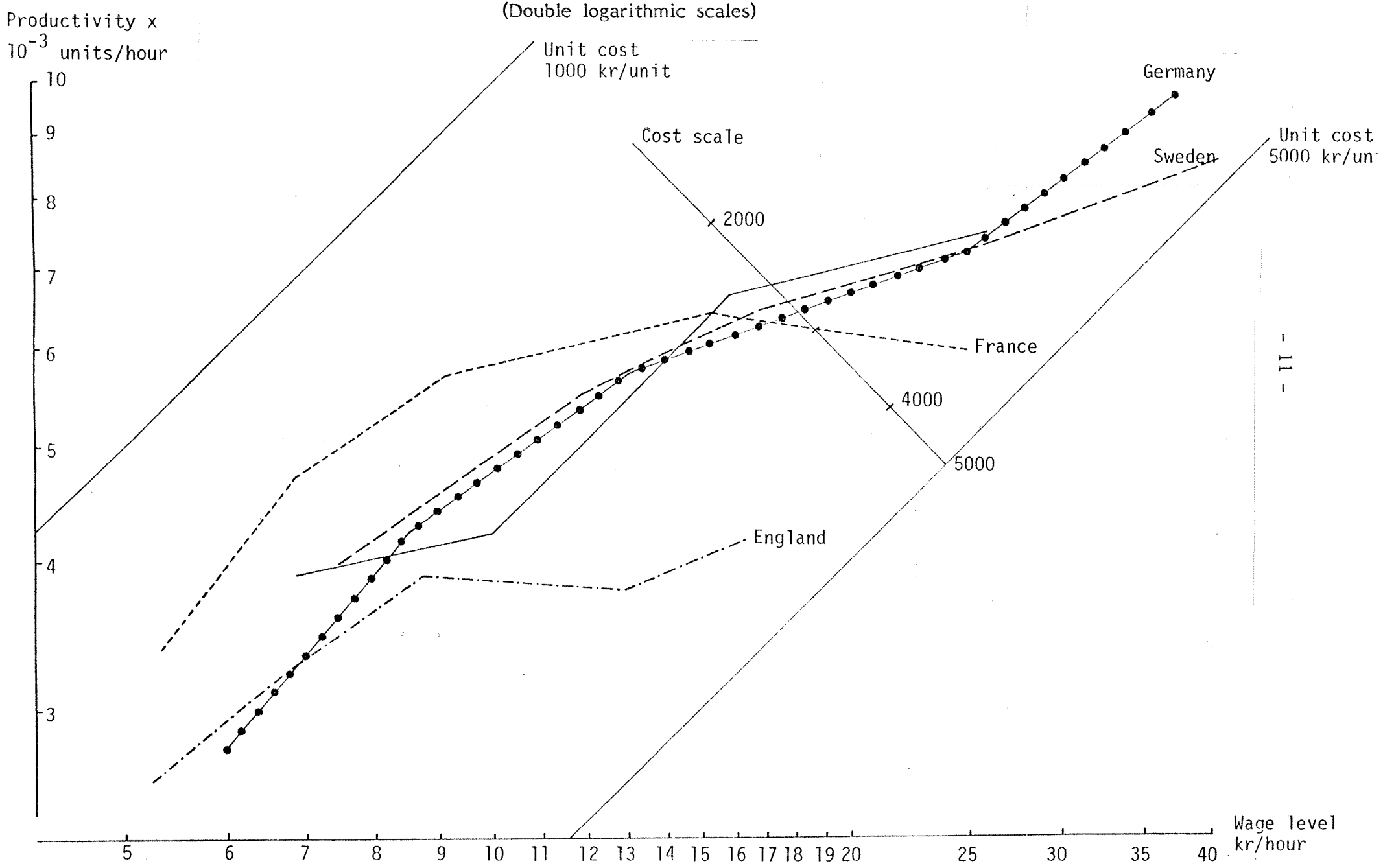


Figure 4 is constructed in the same way as figure 3 and is based upon the same information. The difference is that every country's pattern of change now can be followed over time. Every country's curve in the diagram shows a curvature of the same type as that of the average curve in figure 3. In some countries, however, the pattern has been more unfavorable than others. The French pattern has, e.g., been very unfavorable after 1970. Only a small increase in productivity has taken place, in spite of very large wage increases. Up to 1970 the French plant was the most competitive, but this position has now been lost. Productivity in the Italian plant has followed wage increases better. The productivity level in the English plant has lagged substantially behind the others for the whole period studied. In England, productivity now has reached the level which the Swedish plant had in 1962. Lack of understanding between labor-market parties has been given as one explanation but since the wage-level increase in England has been very slow the competitiveness of the plant within the group has been preserved or even improved.

The competitiveness of the Swedish plant is lower today than ever, depending, among other things, on the fact that Swedish production has lost its leading position with respect to productivity since 1974. Similar examples of the labor cost development in Swedish plants in comparison with foreign plants can be acquired for other companies.

Lost competitiveness and comparative advantages?

The development of costs has been unfavorable but parallel for all the plants. In reality these production units do not "compete" with each other in the traditional sense. They are all parts of a production system that jointly competes against other manufacturers of the product. The competitiveness of this "system" can be measured in terms of how favorably the costs of the whole company have changed in relation to prices.[5] For this the average for the European plants are of interest.

Figure 5 Development of profitability gap 1962-77

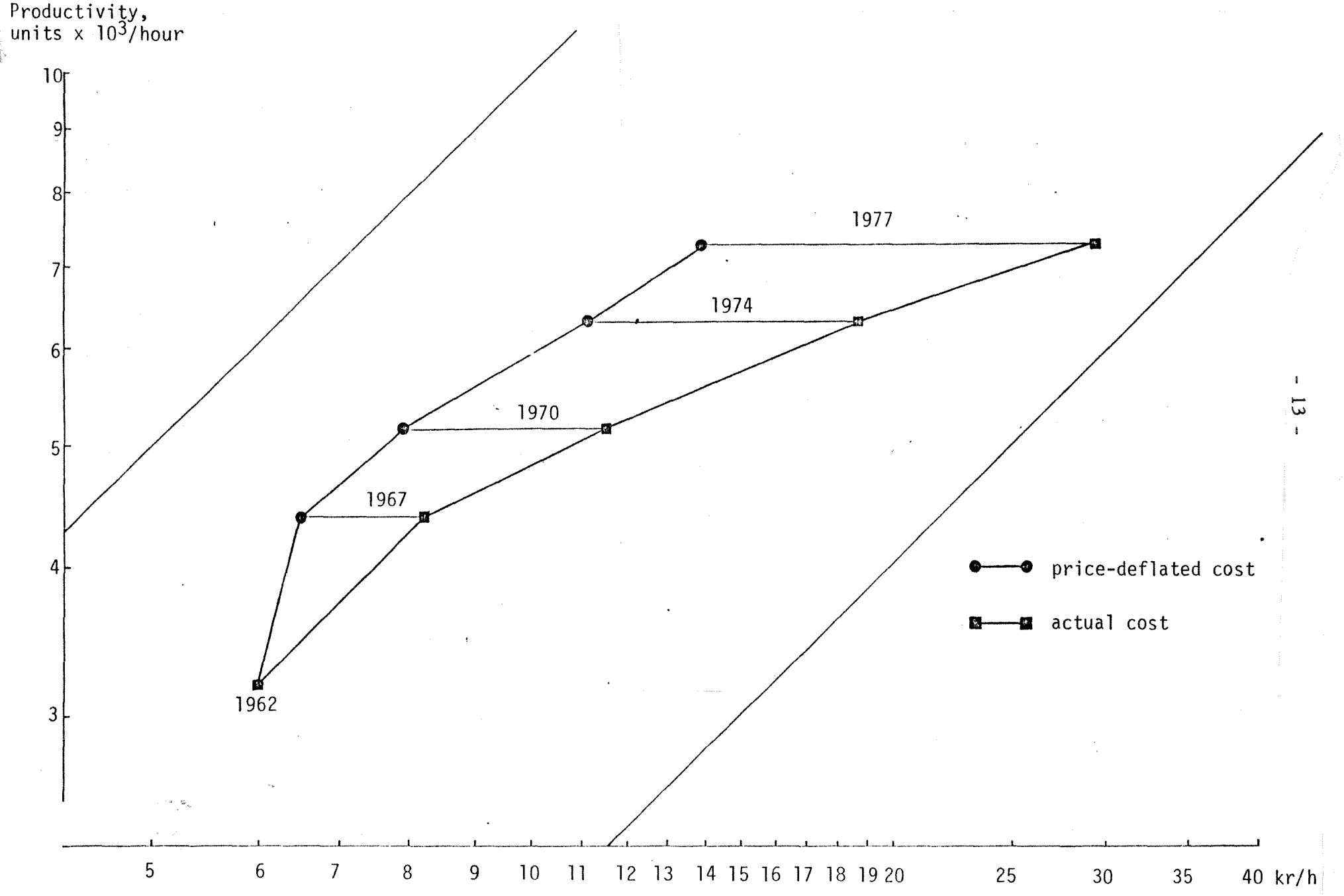
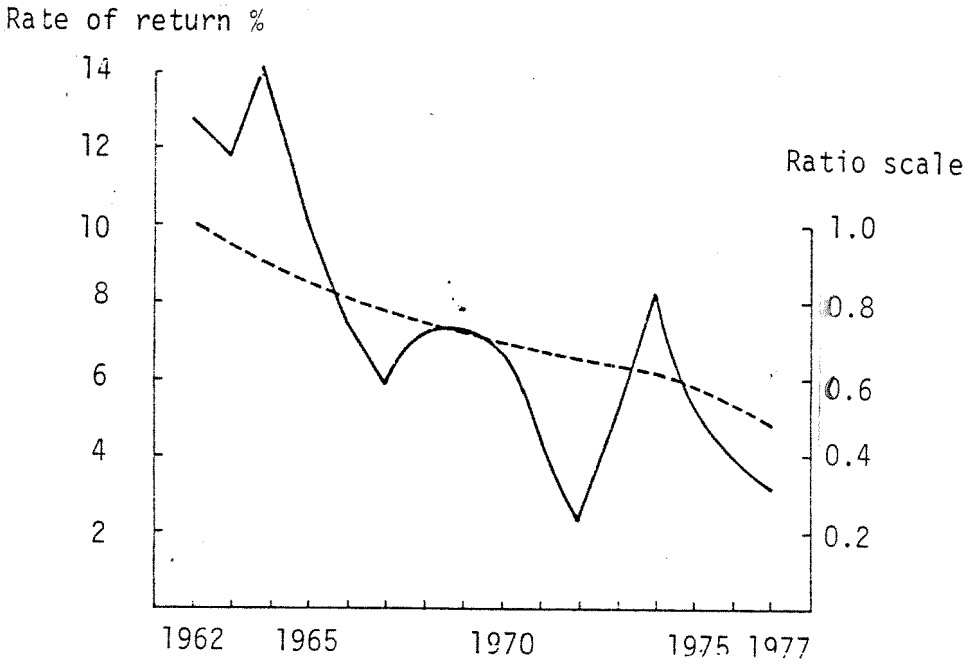


Figure 6 Rate of return on total assets 1962-77



——— Rate of return for total company (left scale)

- - - - - Ratio between calculated "share preserving" and actual unit labor cost (right scale)

A simplifying factor in our analysis is that material input prices have developed parallel with output prices thus implying that the materials cost share has not changed significantly.[6] Therefore, overall competitiveness can be analyzed in terms of wages, (labor) productivity and product prices.

This development is shown in the same kind of double-logarithmic diagram as figures 3 and 4. (See figure 5.) In this figure the lower curve represents the pattern of change in average productivity and wages for the production units in Europe (which also appeared in figure 3). The upper, somewhat less curved curve has been computed from additional information about prices of the product. It shows the (average) wage increases the company could accept, given the actual productivity increases which have taken place, if a constant share for other factors is to be maintained (including profits) beginning in 1962.

The choice of 1962 as a starting year is arbitrary but the tendency appears more clearly by this procedure. The horizontal distance (the profitability gap) between the two curves increases over time. This means, broadly speaking, that the ratios between the wages the company has to pay in order to retain the labor force and the wages it would like to pay in order to maintain the 1962 profitability increases over time.

This increasing gap should affect profit margins and rates of return assuming that capital saving technological change stays within reasonable limits. As can be seen in figure 6, this is also the case. The rate of return on total assets has declined quickly from a high of 13 percent in 1962 to a low of 3 percent in 1977. The previously shown ratio between the "share preserving" and actual wage costs also shows in the figure. Its trend follows the trend for the rate of return.

Diminishing comparative advantages?

A question is whether this very quick reduction in the overall rate of return not only reflects the downward trend in profitability in European industry but also mirrors a structural change component, that is, a loss of comparative advantage in the production of this special product in Western Europe.

Considering the labor intensiveness of this product, the localization of competition to low-wage countries, the increasing factor mobility (especially capital), the greater easiness of technology transfer, and the trends towards free trade, such a question seems appropriate. In accordance with studies on productivity and the international division of labor, sectors losing comparative advantages usually also experience profitability losses greater than other sectors.[7]

Comparison with industrial profitability losses in Europe

The countries shown in table 4 represent the European pattern since no overall European industry data are available. The profitability measurement in English industry seems, however, to be sensitive to depreciation rates, which could explain the great discrepancy for this country between the two sets of data used in the table.

Taking into consideration the great difficulties in measuring rates of return and comparing them between countries, the figures in table 4 support the hypothesis that the firm observed during the period has been loosing in competitiveness in its European production.

The company's profitability has decreased markedly quicker as compared to profitability of other industries both in Sweden and in Europe. This seems to suggest that a defensive strategy in

Table 4 Industrial profitability trends in OECD countries

Yearly rate of decrease in profitability, percent per annum

(Standard deviation in parentheses)

	Western Germany	England	Sweden	Company	USA
1966-76[a]	...	-14.1	-1.9	-7.6	-4.0
		(1.9)	(1.4)	(3.2)	(1.2)
1962-75[b]	-1.5	- 2.9	-1.5	-8.3	-2.6
	(0.2)	(0.5)	(0.4)	(2.2)	(0.4)

[a] Profitability calculated as: /A - pK1/A. When = gross profits, A = total assets, p = depreciation rate, K1 = production equipment capital. See Eliasson, G, Profit Performance in Swedish Industry, Industrikonjunkturen, hösten 1976.

[b] Refers to industry and private services. Peter Hill, Measurement of Profit, OECD, Paris 1979. In the present study, profits are measured excluding depreciation.

order to maintain an overall profitability for the company would be to diversify and/or to shift production of this product from the countries where the product has the lowest relative competitiveness to the countries with the highest competitiveness. In fact, this is exactly what has taken place recently.

Summary of findings

One hypothesis investigated in this case study was that rational behavior on the part of the firm meant imposing a uniform rate of return requirement across all its subsidiary operations. Under certain conditions believed to be satisfied in this case, this is synonymous to minimizing unit wage costs or making unit labor costs uniform across all subsidiary operations. We have found this to be roughly the case, even though such adjustments take their time. Since wages (including payroll taxes and other charges) even though different between countries, are more or less given from the outside of each subsidiary, the prime adjustment variable has to be labor productivity. It also seems to be time that while subsidiary unit labor costs have moved within a narrowing band, productivity levels have varied a lot to offset the cost effects of varying wage levels. Even though more efficient techniques and organization of production - measured by their labor productivity - exist within one group of companies, it has not been profitable to allocate scarce capital resources to enhance it because returns to investment may have been higher elsewhere in the group.

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Footnotes

[1] Ideally the weight should be determined from the output side (by relative prices). In this firm, however, they are determined from the input side (by relative costs). The difference between the approaches reflects differences in profitability between product groups in the year the weights are chosen. The influence of such a discrepancy between weighting systems is probably of minor importance in this case since the company attempts to realize equal rates of return across countries and since profits constitute a small share of total revenues. The mathematics behind this productivity measurement method is presented in Eliasson (1976, pp 296 ff).

[2] See Eliasson (1976, p 287).

[3] It could be argued that the causal relation should be reversed, that is, if productivity is low, wages are low. In our case, since only one company is studied, it is reasonable to assume that the overall wage level is determined outside the firm, that is, wages are exogenous.

[4] The wage level has been converted to Swedish currency with the help of average exchange rates each year.

[5] C.f. Eliasson (1976) p. 181, case C.

[6] The materials cost share has decreased slowly from ca 30 percent in 1962 to ca 25 percent in 1977, thus reflecting both a small improvement in material prices vis à vis product prices and certain reductions in material inputs per unit of output.

[7] See e.g. Lindström (1977), Posner (1961).

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