

Summary:

Export Logistics in Small and Medium Sized Firms

This report has been organised into two separate parts: A and B. Part A has the form of a descriptive business sector analysis, whereas part B is a statistical analysis of the factors that determine the size of the firm's total logistical costs and operating profits.

Part A: Analysis of The Firms' Characteristics and Their Transport to External Markets.

Objective and Problem

The project has had the goal of acquiring knowledge about small and intermediate firms' export activities and international distribution activities. The export market has been divided into four export regions: Scandinavia, Western Europe, Eastern Europe and other countries. Based on telephone interviews with 461 firms together with 12 case studies, the firms' transport has been analysed and discussed.

Exports to Scandinavia

Scandinavia was the most important market for 46% of the firms in the sample. The average firm that exports to this market is relatively small and tends to produce finished products, but larger firms are also represented here. Firms in 12 of the business sectors that we looked at list Scandinavia as their most important export market.

Lorries are the most important mode of transport for exports to Scandinavia. Within each business sector at least 75% of the firms have listed lorries as their most important mode of transport. Although the automobile has an important status, all automobile transport is not direct transport. Reloading and the consolidation of freight in terminals occurs to a certain extent even when lorries are used for the entire transport.

The firms plan their own transport to a varying extent. There are big differences between the various business sectors: 50% of the fishing industry firms plan their own transport, whereas none of the firms in the group "Other industry" do so. Very few firms conduct their own transport. The greatest percentage of firms that conduct their own transport to Scandinavia are in the category "Other industry" (17%).

Exports to Western Europe

Western Europe was the most important export market for 35% of the firms in the sample. The firms that export to Western Europe are somewhat bigger on the average than those that export to Scandinavia. These firms mainly produce finished products with the exception of the fishing industry firms, where only 20% of the firms in the industry produce finished products. Firms in 12 business sectors listed Western Europe as their most important export market.

Transport is planned to a varying extent in different business sectors. The ratio of transport costs to operating revenues varies among different business sectors from 2 to 6%. The average transport time within each business sector varies between 1.3 and 6 days, depending on the industry.

Exports to Eastern Europe

2% of the firms in the sample have exports to Eastern Europe. The size of these firms varies from 6 to 107 employees, and they produce finished products to a greater extent than the firms that export to Scandinavia and Western Europe. Firms in seven business sectors list this market as their most important export market.

Most firms use lorries in direct transport without reloading when they transport their products to Eastern Europe. The planning of this transport tends to be contracted out to external transporters and forwarding agents. Transport costs vary from 1 to 9% of the firms' operating revenues. The transport time varies between 1 and 2.5 days.

Exports to Countries Outside of Europe

Countries outside of Europe (Other countries) are the most important export market for 14% of the firms in the sample. On the average the firms are large, but within each business sector and between different business sectors there are big variations. With the exception of the metal industry, at least 70% of the firms produce finished products. Firms in nine business sectors have their most important export market in countries outside of Europe. Ships are the most important mode of transport.

Part B: Analysis of Firms' Logistical Costs and Operating Profits

Objective and Method

The objective of this part of the report is to explain which conditions determine the firms' logistical costs. This analysis is carried out by means of

regression analysis of the data material that has been described and utilised in part A of the report.

What Determines The Firm's Total Logistical Costs

From the analysis of the firms' total logistical costs and operating profits we have drawn the following conclusions:

- Total logistical costs increase on average by 9.4 percent when the sales increase by 10 percent. Percentage-wise the operating profits increase just as much as the sales.
- Total logistical costs increase on the average by 4.0 percent, and the operating profits by an average of 3.3 percent when the value added ratio increases by 10 percent. The value added ratio is defined as the ratio of the value added to inputs.
- Total logistical costs are reduced by an average of 0.2 percent when the percentage of exports in the total sales increases by 10 percent.
- Total logistical costs increase by an average of 0.3 percent when the total lead time increases by 10 percent. Changes in lead times have no statistically relevant effect, however, on the firms' operating profits.
- The operating profits increase on the average by 13.9 percent when the firm's score on an indicator of delivery quality increases by 10 percent. This indicator has no statistically relevant correlation, however, with the firm's total logistical costs.
- Total logistical costs are reduced by an average of 1.7 percent when the turnover of the stocks increases by 10 percent. However, the turnover of the stocks has no statistically relevant effect on the firms' operating profits.
- Firms that have at least 5 years experience with exports to what is currently their most important export market have total logistical costs that are an average of 5.1 percent lower than those of other firms.
- Firms that have problems with incoming deliveries have an average of 8.7 percent higher total logistical costs and an average of 14.4 percent lower operating profits than firms that do not have these problems.
- Firms that have problems if a short-term decline in orders occurs have an average of 9.2 percent higher total logistical costs and an average of 35.9 percent lower operating profits than firms that do not have these problems.

Lead Times

Recent logistics literature focuses strongly on the fact that a reduction in lead times reduces costs and increases the firm's profitability.

In the table below the average lead time has been calculated for sales to each of the four markets that have been defined in the data material and for each of

four lead time components. The table shows that with only one exception the transport time is the smallest lead time component for each market.

Average Broken-down Lead Time in Days, According to Market.

	Scandinavia	Western Europe	Eastern Europe	Other countries	All Countries
Internal order lead time	5.5	5.2	4.5	8.9	5.8
Manufactur-ing time	9.2	10.2	4.4	13.6	10.0
Time in finished product stocks	3.9	3.0	4.6	4.9	3.8
Transport Time	3.1	3.2	1.5	2.8	3.0
Total lead time	21.4	25.3	14.6	51.1	26.6

From the results in the table we draw the conclusion that it is *not* the transport time or the transport costs that explain the correlation between increasing lead times and increasing total logistical costs. Transport time alone does not have the kind of relevant effect on total logistical costs that the total lead time has. Since it appears that we can exclude transport time and costs as an explanation of the demonstrated correlation, we must look for an explanation among the other lead time components.

Indicators of Delivery Quality

A superior delivery quality can not be expected to give rise to reduced logistical costs, but rather to the customer's tendency to continue to use the same supplier. Therefore it is also reasonable that we find that a higher score on the indicator for delivery quality is correlated with higher operating profits, whereas a corresponding correlation with logistical costs has not been demonstrated.

Criteria for Success

Our results show that both the length of the lead time and the firm's delivery quality have a demonstrable correlation with the firms' success, but in different ways: the delivery quality has a positive correlation with the firms' operating profits, which are our measurement of success in the market, whereas the length of the lead time has a positive effect on total logistical costs. We therefore conclude that delivery quality is important for the firms through the effect it has on sales and not least on resale, whereas lead times mainly have a demonstrable effect on the firm's costs.

In the ongoing research in this area it appears to be more fruitful to focus on product-market combinations rather than business sectors. Thus, it looks as if there are characteristics of the product-market combinations that are both the main cost promoters and the main "success promoters", and which are therefore interesting for logistics research.