Success Factors for Forest Machine Entrepreneurs

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ABSTRACT

The purpose of the study was to determine the competitive strategies of the most successful forest machine contractors. Porter's strategy of focus was applied. Forest contracting businesses were assumed to have three alternative focus strategies, of which two, customer focus and geographic focus, were operationalized and measured. The success of the businesses was measured by financial results and strategic position.

A total of 27 entrepreneurs were personally interviewed. The average age of the entrepreneurs was 46 years, and the length of time as an entrepreneur, 19.5 years. The businesses employed an average of 5.1 permanent staff, and owned an average of 3.9 machines, about 40% of which were harvesters. The profitability of even the best businesses was excellent only during two of five years. Larger companies were in the top 50% of income generators, while smaller businesses were in both the upper and the lower halves.

The businesses in the most successful group had only one customer each, with whom the business was able to achieve a sufficiently high rate of capacity utilization and the operating radius did not grow to be too large. The competitive strategy for the group was customer focus. The question of sufficient solidity would be the criticism levelled at the most successful group. The capital costs were in excess of 30% and indebtedness was more than 50% of turnover. The strategic position for the best business group is judged to be fairly good.

Keywords: *Forest machine contractors, success factors, profitability, strategic group, competitive strategy.*

INTRODUCTION TO THE FOREST MACHINE CONTRACTING SECTOR

The forests are crucial for the Finnish economy. In 1993, the forest industry accounted for 7.28% of the GNP. A total of 34.4% of the exports were forest industry products. The value of forest industry products exported was 46.1 billion Finnish marks in 1993. Of those exports, 52% were paper products, 15% board products, 13% sawmill products, 6% pulp, converted paper and board products 5%, plywood and veneer 5%, and other products 4% [8]. Nearly all the raw material for this important branch of industry is delivered by about 1500 forest machine entrepreneurs. These entrepreneurs carry out the harvesting, 75% of which is done mechanically using harvesters, and the forwarding to the strip road. Generally, the raw timber is bought from the forest owners by the forest industry; sometimes, however, the forest machine entrepreneur is the buyer. These entrepreneurs are in practice completely responsible for caring for the biodiversity of the forests, and their handiwork is evident in the forest for a long time. The entrepreneurs, therefore, are effectively in charge of the public image of the forest economy even though they are unable to influence forest treatment policies. Timber transport to the mill is done by another group of small entrepreneurs, the timber truckers, which number about 1200 [11].

Since the 1970s, profitability in the forest machine contracting business sector has been good, as measured by operating surplus [9, 10, 12, 15, 17]. High operating surpluses are an indication that operations have been effective. On the other hand, net income, which shows the financial return to the entrepreneur himself, has been negative for over a decade [21, 22]. The return on investment, however, which at times was very good, shows that the profits from the entrepreneurship were reaped by the financiers. The intense investment activity into harvesters has been more easily explained by both the rapid technological aging of the machines and the swift mechanization of harvesting. Forwarders, however, have been technologically stabilized and continued investment in them would be more difficult to motivate. The financial returns from forest machine contracting have, therefore, been used mainly for new investments. Therefore, and also as a result of poor profitability at times, the businesses in the sector are heavily indebted on average. The solidity of the sector has been poor during the past ten years [17]. The biggest reason for the poor profitability in

the sector is the continual overcapacity and the high overhead costs, which has forced the entrepreneurs to be flexible in terms of price, but not capacity, in a competitive situation. In spite of the fairly poor profitability of the sector on average, some businesses have been more successful than others.

METHODS AND MATERIALS

Focus Strategies

The purpose of the study was to determine the recent progress in the profitability of the sector, as well as the competitive strategies of the most successful businesses and business groups, i.e., strategic groups [2, 3, 4, 5, 7, 18]. The main goal of the study was to make the connection between the competitive strategy of the entrepreneur and success. The study has made use of Porter's [13, 14] strategy of focus. It was assumed that a forest machine contracting business was able to utilize three different focus strategies:

1. Customer focus: this strategy is represented at an operational level by the number of customers, the value of the customers to the entrepreneur, and the length of the customer relationship.

2. Geographical focus: this strategy is characterized by a small operating radius and a variable number of customers.

3. Market or service focus: this strategy is characterized by a large number of thinning contracts or an emphasis on some other service. This strategy approaches differentiation.

Measurement of Success

Success was measured by the financial results achieved by the business, and by its strategic position. The financial results indicate the absolute success of the business. Income statements and balance sheets were scrutinized to find the successful companies and their internal order of success.

Financial results were used to search for successful businesses on the basis of five indicators. The years under study were 1987 to 1991. During the study a method was developed where a single figure indicated the value of the business. The method is based on the principle that the indicator for the business is divided by the annual median for the

sector multiplied by one hundred. The resulting figures were added, except that the relative debts were subtracted. In this way it was possible to rank the businesses in order of exellence. The indicators used were the percentage figures for operating margin, net income, ROI and equity ratio, and the proportion of total indebtedness of turnover. These five indicators were thought to measure both the profitability and the financial solidity of the business with sufficient reliability and from a satisfactory number of points of view.

The strategic position indicates success now and in the future, i.e., it describes the potentially best possible success in the future [6]. A good strategic position comprises the following factors:

1. The business has a history of good financial results, which include good profitability and, consequently, excellent solidity.

2. The business possesses good resources. These include a suitable fleet of vehicles, skilled workers, innovative management, and sufficient solidity (point 1). In other words, the business has the ability to effectively realize its potential and actively look for new solutions.

3. The business has good customer relations. These include growing markets subject to open competition, and opportunities for differentiation.

Cluster Analysis

Cluster analysis, Ward's method, was used to verify the strategic groups. Cluster analysis is used for measuring similarity. Clustering is a statistical multivariate method, that deals with a sample of entities and seeks to organize these entities into as many homogenetic groups as possible.

The basic problem is to find the set of variables that best represents the concept of similarity under which the study operates. Ideally, variables should be chosen within the context of an explicitly stated theory that is used to support the classification. The theory is the basis for the rational choice of the variables to be used in the study [1].

The primary reason for the use of cluster analysis is to find groups of similar entities in a sample of data. Ward's method is designed to optimize the minimum variance within clusters [19]. This objective function is also known as the within-groups

sum of squares or the error sum of squares (ESS). The formula for the error sum of squares is:

$$ESS = x^2_i - 1/n(\textstyle\sum x_i)^2 \qquad (1)$$

where x_i is the score of the ith case. At the first step of the clustering process, when each case is in its own cluster, the ESS is 0. The method works by joining those groups or cases that result in the minimum increase in the ESS. The method tends to find (or create) clusters of relatively equal sizes and shapes as hyperspheres [1].

Research Material

The businesses studied were included in the central sector register of the Business Reseach Department of the Central Association of Finnish Cooperative Banks (OKL). The study included 27 entrepreneurs, all of whom were personally interviewed. Year-end financial information was collected during the interviews, as well as background data on the business, the customers, and the quality of the competitiveness. Information on the strategic, tactical, and operative activities of the business and the future prospects of the entrepreneur was also compiled.

Income statements and balance sheets were adjusted on the recommendation of the Business Study Committee [20]. Wages were adjusted after querying the entrepreneurs on the number of hours they worked during 1990. The hourly wage used was 48.3 marks/hour. The wages calculated for 1990 were correlated to turnover, and this percentage figure was used for adjusting the wages for each year. If the entrepreneur was paid only a partial wage during one or more years, this was taken into account when the wage adjustment was made. If the entrepreneur had received a wage that was considered sufficient, naturally no wage adjustment was made. The wages were increased by an average of six per cent of turnover.

RESULTS

The Forest Machine Contracting Sector

The average age of the entrepreneurs was 46 years and the length of time as an entrepreneur 19.5 years. An average of 5.1 persons were employed as permanent staff. The business owned an average of 3.9 machines and the proportion of harvesters was 40%. The operating radius of the businesses was an average of 62 km and the area of business activity covered an average of 6.2 municipalities.

The turnover of the group of businesses increased from about one million marks to over 1.8 million marks in five years. On average, the turnover grew by about 17% per year. The deviation above the median was clearly greater during the period of study (Figure 1).

The median net income percentage was negative for the entire period under study (Figure 2). The negative net income indicates, among other things, that the entrepreneur worked without pay or that the salary of the entrepreneur for the whole period has been smaller than that of the operators, among others. The return on investment, however, which at times was very good, shows that the profits for the entrepreneurship were reaped by the financiers. In 1991, the median interest encumbrance percentage was over 10. Profitability was good for only two years even for the best businesses.

The relationship of total indebtedness to turnover was fairly high for the group of businesses (Figure 3). A slight change took place in 1991. When the lower quartile of the indebtedness/turnover moved farther away from the median. This means that the solidity of solid companies improved and the solidity of the businesses in debt declined.

Strategic Groups

The successful entrepreneurs did not differ from the average entrepreneurs in average age or length of time as an entrepreneur. The average size of the fleet of vehicles for the study group was 3.9, and 3.3 for the successful entrepreneurs. The fleet of vehicles of the successful entrepreneurs was nearly two years younger than these of less successful businesses, and the degree of indebtedness was smaller. The proportion of harvesters owned by the successful businesses was only 20%, whereas it was 40% for the average businesses. The larger companies were in the top 50% of income generators, whereas smaller businesses could be found in both the upper and the lower halves.

Of the hypothetical competitive strategies presented above, only alternatives 1 and 2 were tested. The following variables were used for grouping: financial result, number of customers, length of customer relationship, the sum of the points given
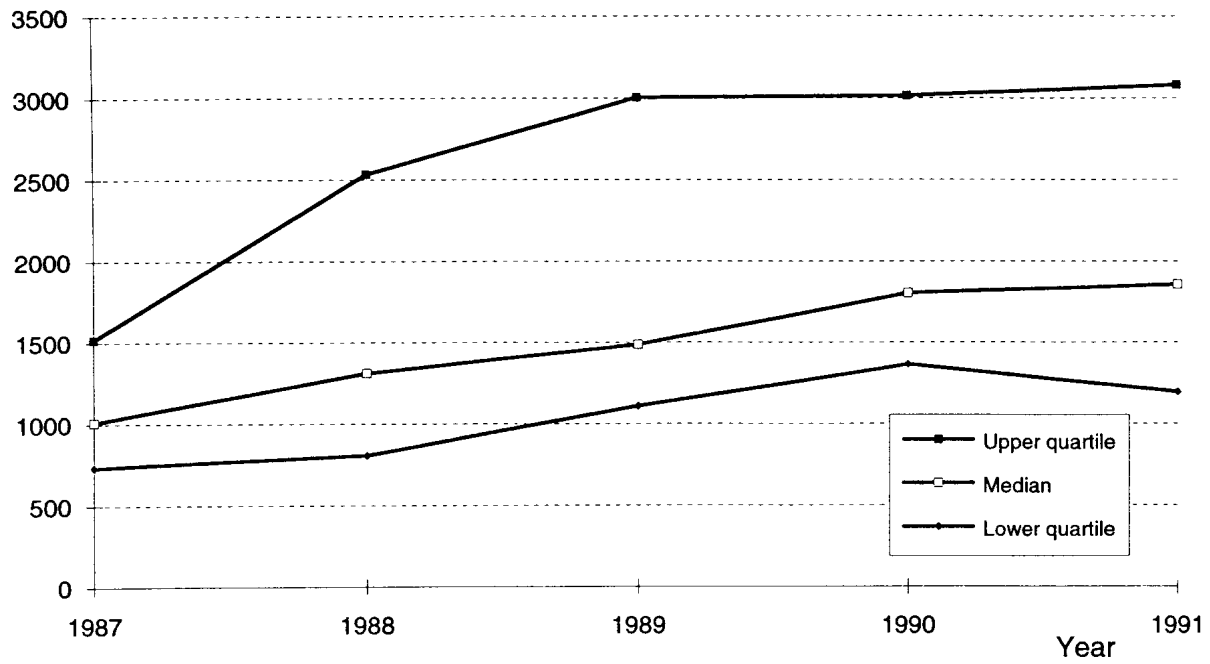
Turnover, 1000 FIM

Figure 1. Turnover of the industry during the years 1987 to 1991.
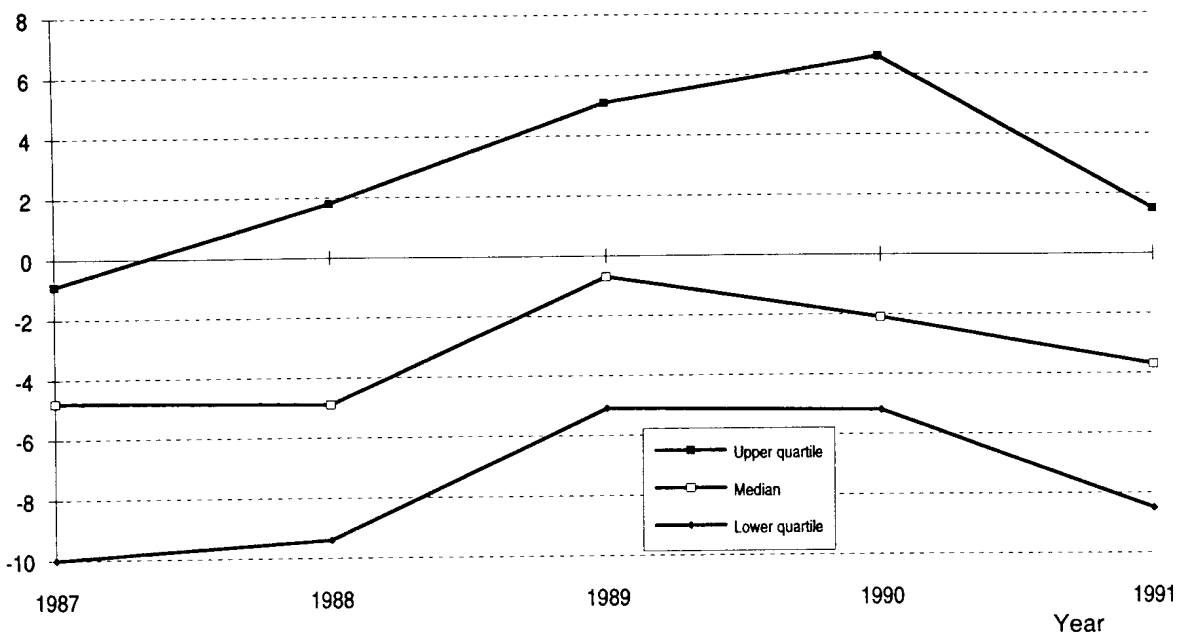
Net income, %

Figure 2. Net income (%) of the industry during the years 1987 to 1991.
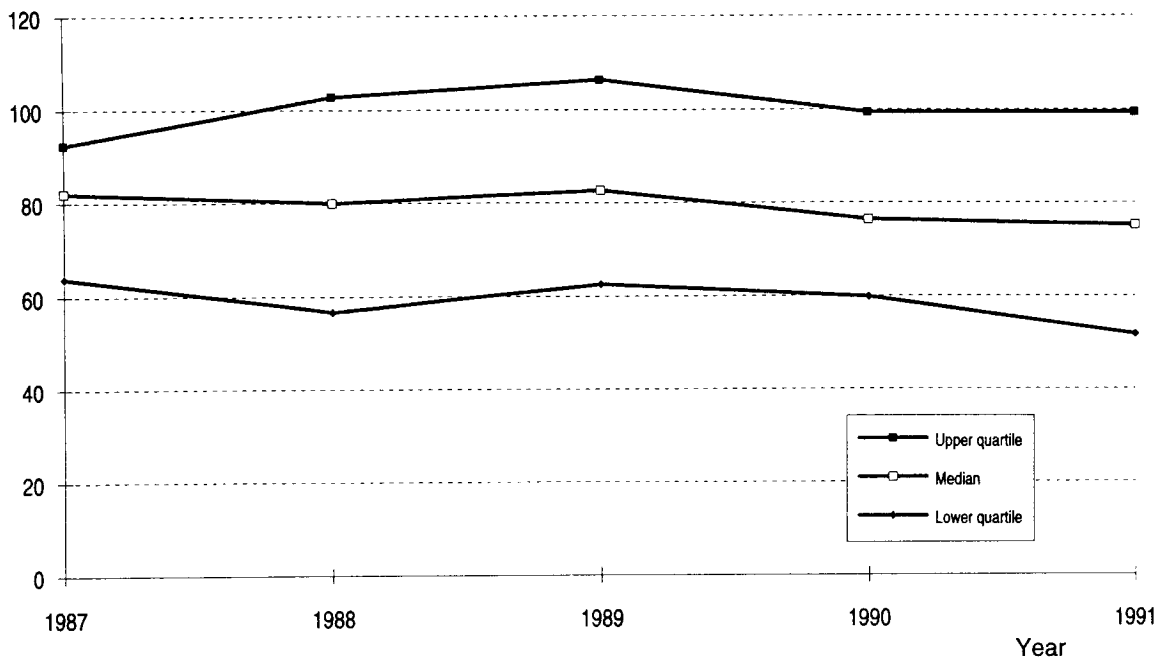
Total indebtedness of turnover, %

Figure 3. Total indebtedness of turnover (%).

to the customers for various operations, and the operating radius of the business. The businesses were clearly divided into two groups, successful and less successful (Table 1).

The successful businesses generally had two customers and the less successful, one. The operating radius of the less successful businesses was 28 kilometers smaller than that of the successful businesses. The successful businesses were more satisfied with their customers. There was no difference in the length of the customer relationship between the two groups.

If the less successful businesses had a competitive strategy, it was alternative 2, i.e., geographical focus. This strategy is illustrated by the small operating radius. This strategy, however, was not competitive.

Clustering further divided the successful businesses into two groups, most successful and moderately successful (Table 2).

Table 1.

	No. of bus's	Financial results	No. of customers	Customer points	Operating radius (km)
Successful	14	2322	2.1	24.8	73
Less Successful	10	-4464	1.3	21.5	45

Customer points = the quality of the customer as a sum of six factors on a scale from 1 to 5.

Table 2.

	No. of bus's	Financial results	No. of customers	Customer points	Operating radius (km)
Most Successful	5	5282	1.0	24.6	64
Moderately Successful	9	679	2.7	24.9	77

Customer points = the quality of the customer as a sum of six factors on a scale from 1 to 5.

The successful businesses had 2.1 customers. Five businesses were classified as the most successful, and had only one customer. This group therefore clearly used alternative 1, i.e., customer focus, as their competitive strategy. The second group, moderately successful businesses, had 2.7 customers. Satisfaction with the customer was at the same level and the operating radius differed by 13 kilometers. The length of the customer relationship in the most successful group was 19.2 years, which was 2.1 years longer than the moderately successful group.

The most successful group therefore seemed to use customer focus as their competitive strategy. This group had the correct target markets and good customers. The moderately successful group had 2.7 customers and a poorer financial result. From a customer point of view, a business with more customers may be in a secondary position. This type of business is offered less advantageous contracts and work sites and are used more during peak periods. Even though the number of customers reduces dependence on one customer, the price seems to be a poorer financial result. On the other hand, the number of customers does not explain the poorer financial result in a linear fashion, since the number of customers in the group less successful businesses was only 1.3. After clustering, the less successful businesses had only one customer. The number of customers is not, therefore, decisive, but the quality of the customer, i.e., the correct target markets from the point of view of the business is decisive. The number of customers probably affects the growth of the operating radius for the moderately successful group.

Turnover and Capacity Utilization Rate

Finally, it might be useful to look at a situation where business size (= turnover) and capacity utilization rate are considered in addition to strategic variables. The group of businesses again falls into the same two distinct subgroups as above (Table 3).

The successful businesses had a larger turnover and had a larger operating radius and a higher rate of capacity utilization than the less successful businesses. The successful businesses were further subdivided into two groups as above (Table 4).

Of the successful businesses, those with the smallest turnover were the most successful. Regardless of grouping principles we find that the one-customer businesses were always the most successful. Of the successful businesses, those with several customers were always less successful. The optimum operating radius seems to be around 65 kilometers. The results are not quite as clear when it comes to capacity utilization rate. It seems that if it is necessary to increase the operating radius or to find new customers in order to raise the capacity utilization rate, the financial result suffers. This conclusion is true for the successful businesses. In the less successful business group, a limited operating radius and a low capacity utilization rate seem to go together, since this group generally had only one

Table 3.

	No. of bus's	Financial results	Turn-over	No. of customers	Customer points	Operating radius (km)	Capacity util. rate
Successful	13	2427	2122	2.2	25.0	67	88
Less Successful	10	-4464	1319	1.3	21.5	45	74

Customer points = the quality of the customer as a sum of six factors on a scale from 1 to 5.

Table 4.

	No. of bus's	Financial results	Turn-over	No. of customers	Operating radius (km)	Capacity util. rate
Most Successful	6	4733	1732	1.0	67	92
Moderately Successful	7	450	2457	3.1	68	85

Turnover= turnover in 1000 Finnish marks.

customer. It seems that these businesses have not had a sufficient number of jobs; it is not directly a question of a bad customer. From a business point of view, however, the target market was poorly chosen, since the business was not able to carry out its competitive strategy, coupled of course with an optimum capacity utilization rate.

Summary

In summary, three significant groups were found among the material. The most successful businesses had one customer, with whom the business was able to reach a sufficient capacity utilization rate and the operating radius of the business did not grow too large. As a result, the group did better than others.

The second most successful group was obliged to work with three customers while the operating radius was reasonable, but the capacity utilization rate remained lower than that of the most successful group. Since this group had three customers it was more independent, but either an increase in customers led to an increase in operating costs or this kind of entrepreneur was paid less for his services. Contracting for one customer may also mean economies of scale. Optimization of capacity utilization is more difficult if there are several customers.

The group that was least successful generally had only one customer, a small operating radius, and a low capacity utilization rate. This group was unable to secure an adequate capacity utilization rate from its customer, and had been unable to find other customers as had the previous group. The result was an unprofitable business.

The fourth group is the small, reasonably successful businesses. This group had been able to increase its capacity utilization rate to 99% by extending its operating radius and increasing the number of customers. However, the financial returns of this group were smaller than those of the second most successful businesses, even though the capacity utilization rate of the latter was only 85% with the same number of customers, and the operating radius was 19 km smaller.

DISCUSSION

The group of most successful businesses comprised six businesses that had one customer and an operating radius of 67 km, a 92% capacity utilization rate, and a turnover of 1 730 000 marks for 1990. When the potential future success of this group is considered, the criteria for a good strategic position must be kept in mind. The businesses in the above group demonstrate a fairly good history of financial returns (point 1). However, profitability and solidity cannot be considered excellent in relation to anything but other businesses in the sector. The businesses had good customer relations (point 3). As a result, the operating radius, the capacity utilization rate, and the turnover are close to optimum from the point of view of financial return.

Point 2 sets out the criteria of a good strategic position as being good resources and sufficient solidity. Capital costs were over 30% of turnover and indebtedness was over 50% of turnover. The businesses are, therefore, burdened with high fixed costs, which often means that the business must stoop to price competition to keep up its capacity utilization rate. These businesses also need continuously high profitability in order to be flexible with capacity, not price, in a situation of excess capacity. Thus the strategic position of the most successful group of businesses is judged to be fairly good. The strategic position of the other businesses is judged to be poor and the road to success for these businesses will require strategic moves, not only an attempt to raise the capacity utilization rate.

Is, then, the position of the best strategic group secure, i.e., how high are the mobility barriers that protect the group? Are the mobility barriers high, and are they easy to overcome by other entrepreneurs? This study showed that operating radius, capacity utilization rate and the fact that an entrepreneur only has one customer proved to be the most significant mobility barriers. The first two factors have to do with the customer, i.e., the customer's awareness of prices, and his power over the business, in the final analysis, determine the height of the mobility barrier. At this point, the costs to the customer from changing contracting companies and the effect of the change of contracting company on the price, quality, and working capacity of the service to the customer assume critical importance.

When the customer relationship for the five best companies has been long (19.2 years) then one might ask how far down does the price have to come before the customer takes his business elsewhere. For about 20 years, the price has not come down enough for the customer to take his trade elsewhere.

Naturally, the price of the businesses has perhaps been flexible, but the fact that this group of businesses is the most successful proves that the price has not needed to be flexible to the point of dipping clearly below the limit of profitability, at least not for long. During times of price decreases the businesses have apparently been able to improve productivity. It is probable that price in this group of businesses is nearly always flexible to a sufficient degree downwards, and therefore this customer relationship has become a nearly insuperable mobility barrier for other entrepreneuers. The long customer relationship also perhaps shows that the customer is not interested in short term relationships with businesses that offer low prices, if the result is the termination of a long term relationship that is functioning well, with a simultaneous reduction in the quality of service and the effectiveness of the business. The mobility barrier protecting the best business group can only be broken if the customer radically changes his logistics strategy and contractual policy.

As far as the less successful businesses are concerned, the question is, of course, whether anything can be done to improve profitability. What strategic actions does the business have at its disposal for breaking structures in the business and changing from less successful to more successful? The second most successful group of businesses had three customers, an 85% capacity utilization rate and approximately the same operating radius as the most successful group of businesses. This group should, perhaps, change their strategy to customer focus, i.e., reduce the customers to one or two. The group should analyze its customers to determine which customer is the most profitable now and in the future and at the same time try to discover which customer will probably need the services of the business most. The businesses should also assess the progress of the demand for services and strive to allocate resources to fulfil those demands. In practice this would mean that the business should, after choosing its customer, adjust its services and equipment to the needs of that customer.

The above businesses have a fairly large turnover, about 2.5 million marks, but strategically they have apparently come only half way. These businesses have started to grow apparently as a result of an increase in customers, not the volume growth of the one and only customer. This has led to an attempt to be everything for everybody, and service to all customers has suffered, resulting in poor profitability. The businesses have come strategically only half way. The small, reasonably successful businesses are in much the same position. In this group, the capacity utilization rate has been optimized, but the result has been a fairly broad operating radius and three customers. Cutting down the customers by one to reduce the operating radius without reducing the capacity utilization rate would perhaps be sufficient for this group. The least profitable customer relationship should be terminated.

The least successful group generally had only one customer, an operating radius of 45 km and a capacity utilization rate of 74%. This group also gave its customer a poor score. The profitability in this group has really been poor, and a mere raising of the capacity utilization rate might not improve profitability enough. Instead there should be a change of customer. One reason for the poor performance might also be that the businesses are tactically and operationally ineffective. This group has clearly suffered most from the overcapacity in the sector, and has apparently acquired customers by using price as a competitive factor. This group also includes the businesses most likely to leave the sector. The leaving will most probably be in the form of a bankruptcy.

The basis for profitability in the forest machine contracting business is nearly always established during the contract negotiations between the entrepreneur and the customer, regardless of the length of the contract negotiated. Some kind of bidding process is generally undertaken in open sectors before contract negotiations proper. According to one study by [16], some kind of bidding process has preceded negotiations for a transport contract in 63% of the cases. After the bidding process, the contracts, conforming to some extent to the customer's strategy, generally extend over as much as five years. The customer's logistics strategy most often defines the character and length of the contract. Therefore the contracts may be very different from each other even within similar market environments. Therefore, it is important to know the customer's logistics strategy and contract policy. The information is needed when an evaluation is made of the costs of changing contracting companies.

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