

METSÄNTUTKIMUSLAITOKSEN
TIEDONANTOJA 146

Kansantaloudellisen metsäekonomian
tutkimussuunta



ENTREPRENEURS IN RURAL AREAS:

A HUMANISTIC APPROACH TO THE STUDY OF SMALL SAWMILLS
IN NORTH KARELIA, FINLAND

J. ASHLEY SELBY



HELSINKI 1984

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ENTREPRENEURS IN RURAL AREAS: A HUMANISTIC APPROACH TO
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ODC: 832.1:791.3+911

ISBN: 951-40-0957-6

ISSN: 0358-4283

SELBY, J.A. 1984. Entrepreneurs in Rural Areas: A Humanistic Approach to the Study of Small Sawmills in North Karelia, Finland.

The attitudes and behaviours of small-scale entrepreneurs in rural areas (areas of low degrees of socio-economic development) are studied on the basis of a humanistic rather than a positivistic standpoint. The investigation comes close to adopting a phenomenological approach to the entrepreneur and his environment. As such, the investigation is a contribution to contemporary human geography.

A frame of reference establishes that rural entrepreneurs are sufficers, and that their behaviours and activities are boundedly rational with respect to their locations and perceived environments. An empirical investigation of the small sawmill entrepreneurs in North Karelia, Finland, supports the frame of reference.

FOREWORD

The paper forms part of a wider investigation being undertaken at the department of forest economics of the Finnish Forest Research Institute to determine the significance of the small-scale woodworking industries to the socio-economic life of rural areas in Finland. Much importance is attached in the investigation to the role of the entrepreneur in maintaining the economic life of rural communities. The emphasis on the individual has led to the adoption of a humanistic philosophical stance. As such, the paper is a contribution to the on going discussion concerning the role of humanistic philosophies in empirical investigations in geography, economics and sociology.

In the present investigation, the small sawmill owners in the Finnish province of North Karelia serve as an empirical example. The owners were interviewed during summer 1982, and special acknowledgements are due to those busy men who readily gave up their time to cooperate with the investigation. Acknowledgements are also extended to Olli Kiiskinen for his valuable assistance in locating the sawmills and for preparing the way for the interviews, to Sirpa Onttinen for diligently conducting the interviews and for assisting with the analysis, and to Eila Iltanen for coping with the manuscript. I am indebted to Nancy Nuottamo for having guided my early reading in non-positive philosophies.

Ashley Selby
Helsinki, 15th May 1984

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1. INTRODUCTION

1.1. Aim of the investigation

The difficulties encountered by small-scale enterprises in under-developed rural areas of Finland provided the stimulus for this investigation. These difficulties were observed during a study by this investigator into the regional variations in the intensity of field afforestation in Finland (Selby 1980, 1981). In that investigation, regional variations in the degree of socio-economic development were found to strongly affect field afforestation intensity. During the study, discussions with entrepreneurs revealed that while they perceived an environment which was poor for their economic activities, they nonetheless persevered with their enterprises. Thus, any attempt to understand their entrepreneurial behaviour required that many of the assumptions of neo-classical location theories had to be relaxed. The present investigation is, therefore, an attempt to examine the foundations of small-scale entrepreneurial behaviour in areas of low economic development. In particular, the relationship between entrepreneurial behaviour, firm structure and degree of development of the socio-economic environment will be examined, with the aim of estimating the effect of the perceived environment on entrepreneurial behaviour and activities. At the same time, the investigation is a practical contribution to the understanding of the structure of the small-scale woodworking industry in North Karelia, which is taken as the case-study in this investigation. The study is, however, essentially explorative.

The term "small-scale entrepreneur" means here the owner-manager of a small business (in which the owner is also part of the labour force), while the term "rural area" applies to the non-industrialized environment in which employment in agriculture and forestry are important, and in which settlements tend to be scattered, or grouped into

small villages. Administrative centres occur as "expanded" villages and the occasional market town. The rural areas concept used here therefore closely follows the "areas with backwash effects" concept employed by Myrdal (1957) (to be discussed shortly). The small sawmills, which form the empirical material for the investigation are defined by productive capacity. A sawmill is considered to be small if it produces less than 5000m^3 /year. Sawmills with capacities of this magnitude are not included in the industrial classification used to compile the official industrial statistics in Finland, cf. Huttunen 1981.

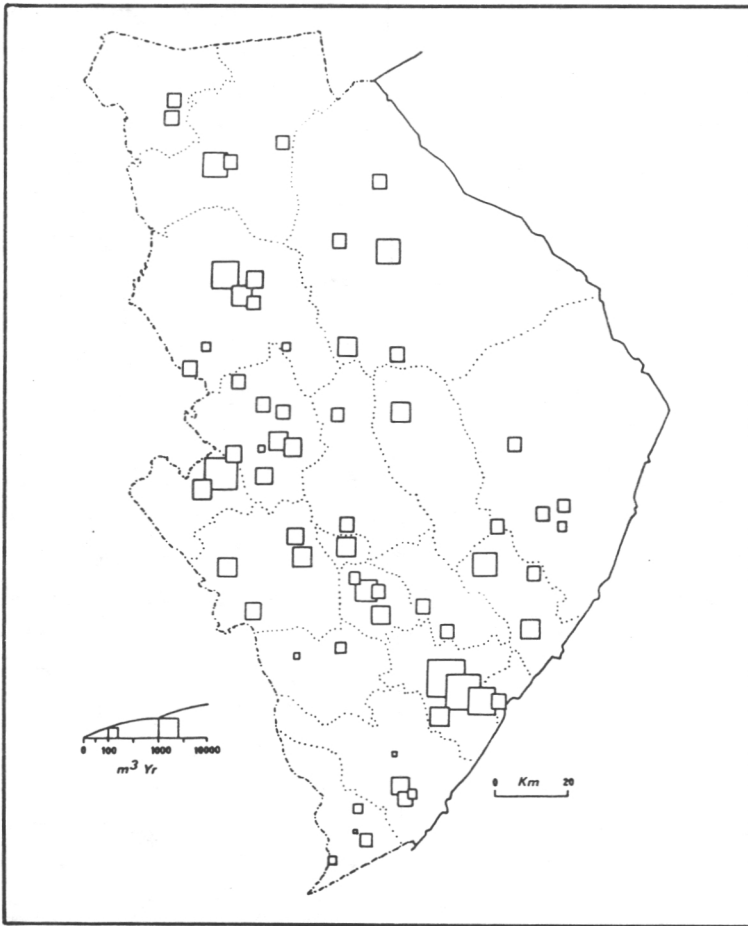


Figure 1. Location and capacity of small sawmills in North Karelia, 1981

1.2. STRUCTURAL BACKGROUND*

The province of North Karelia is marginal to both Finland, and to Scandinavia as a whole. Furthermore, it is a border province; its eastern border is the border between Finland and the Soviet Union. Economic and social links eastward are therefore restricted. The province is located in the eastern extremity of Finland, whereas the main areas of economic growth and development are concentrated in the southwestern part of the country. According to Seppälä (1979) the gross regional product at factor costs in 1973 was 1976 million Finnish Marks (GBP 1 = 8,20 FIM at current prices). This figure was 3,1 % of the gross domestic product. GDP per capita in North Karelia was 9 760 FIM, which was 83 % of the average for the country as a whole. The primary sector is of considerable importance in the economic life of the province. On the basis of value-added in 1977, 31,2 % was produced by the primary sector, compared with 13,4 % for Finland as a whole. Industrial production accounted for 21,3 % of the value-added in North Karelia, compared with 27,9 % for the whole country. The figures for the service sector were 47,5 % and 58,7 % respectively. In 1977, 38,7 % of the total industrial value-added in North Karelia came from the forest industries mainly from large-scale sawmilling. However, the province's forest industries accounted for only 3,8 % of the Finnish forest industries' total value-added.

According to the 7th National Forest Inventory (1980) forestry land accounted for 1 549 000 ha, or 88 % of the land area of province of North Karelia (excluding one commune, Kesälahti). Forest land proper, i.e. productive

*The contents of sections 1.2 to 1.4 were originally presented as part of a paper to the European Association of Agricultural Economics' Seminar on Agriculture and Forestry, Nancy, France, 20-22 April 1983.

forests, accounted for 77 % of the land area. In terms of timber volume, the province had, in 1980, 119 800 000 m³ of standing timber, an increase of 5 200 000 m³ since 1974. Table 1.1 shows the allowable annual cut of saw timber in 1980.

Table 1.1 Allowable annual cut of saw timber in North Karelia, according to the 7th National Forest Inventory

Species	Allowable cut m ³	%
Pine	940 000	48,0
Spruce	197 000	40,7
Deciduous	222 000	11,3
TOTAL	1 939 000	100,0

Table 1.1 demonstrates the seemingly favourable wood supply situation in the province, especially concerning saw timber. However, a great deal of the saw timber leaves the region. Aarne (1981;29) shows that in 1979 over 1,7 million m³ of coniferous saw logs were cut from the forest of North Karelia, of which 999 000 m³ (55 %) remained in the region for processing, while the remaining 45 % left the region. Seppälä (1979) rightly notes that the forest industrial development in North Karelia is poor compared with the situation in the neighbouring province of Kymi, to which North Karelia exported 600 000 m³ of coniferous saw logs in 1979 (60 % of the province's total exports of saw logs) (Aarne 1981; 17 & 29). Seppälä also notes that transportation facilities in North Karelia are favourable for the export of raw materials.

According to a study by Pöyry Oy (1981) c. 35 sawmills are located in North Karelia, i.e. sawmills covered by the industrial statistics. Of these, 3 have a capacity of over

100 000 m³/yr, 3 are in the 50 000 - 100 000 m³/yr category, 8 are medium-sized, i.e. 5 000 - 50 000 m³/yr and c. 20 are small (under 5 000 m³/yr). The total production of sawn timber in the year 1979/80 was 855 000 m³, of which 71 % was produced by the largest mills, 19 % by the three next largest mills, and 9 % by the 28 or so mills with a production of less than 50 000 m³.

The description given above concerns the whole sawmill industry in North Karelia. As stated earlier, it is not the purpose of the present investigation to examine the medium and large scale woodworking industries. It has already been demonstrated that the forward linkages from these industries extend beyond the region, cf. Eskelinen et al. (1978). Of specific concern in the present investigation are the small-scale woodworking industries, and in the first place, the small-scale sawmills, the majority of which have production capacities below 5 000 m³ per year, and which are not included in the industrial statistics (cf. Huttunen 1981). These mills are assumed to serve local demands and to form a basis for further woodworking industries in the region. The present paper is concerned with examining the structure of the small sawmills. At a later stage, the investigation will concern the behaviour of small-scale entrepreneurs and will examine the whole of the small-scale woodworking industry in relation to its socio-economic environment.

1.3. FRAMEWORK FOR DESCRIBING SMALL SAWMILLS

A convenient frame of reference for the description of an enterprise is provided by Ackoff (1970; 46-64), who divides the firm into six separate functional systems: the firm, supply, distribution and sales, consumers, competition, and environment. To this list could be added location and entrepreneurial behaviour. Each system will now be briefly summarized.

The firm: defining the firm results in a set of subdivisions very similar to those listed above. The whole firm is therefore an amalgam of functions - purchasing, maintenance, production, distribution, transportation and finance, as well as manpower, and location.

Supply: this is the provision of the firm with the required materials, equipment, facilities and services required for its operation. Ackoff (op.cit; 48) notes that "it is not uncommon for a firm to assume, even implicitly, that there will always be enough raw material and other required supplies at an acceptable price". It is assumed that this attribute is applicable to the small sawmill enterprises at present being investigated. It must be acknowledged, however, that the large-scale forest industries in Finland are facing serious raw material constraints (cf. Seppälä et al. 1980; 24-27). With regard to material supply, Ackoff (op. cit; 48) notes: "If a firm's consumption of a material ... is a large part of the total consumption, it is apparent that the possibility of self-supply, if not supply to others, should be given serious consideration". The applicability of Ackoff's observation to the small sawmills, which often have close ties to farm-forestry, hardly needs stressing.

Distribution and sales: this is the system that transmits the output of the firm to the consumer. According to Ackoff (op. cit; 49) this system is for many, if not most firms, not entirely under their control. Further, distribution and marketing may be significantly affected by social, economic and technical changes in the environment, e.g. as society "modernizes" or as disposable income increases, or falls, with socio-economic development or decline.

Consumers: the system of consumers is clearly closely related to distribution and sales, i.e. the consumption of the firm's products. This appears to be a problem area, however. As Ackoff (op. cit; 51) points out, few companies

understand why their products are consumed. Companies are also considered to believe their own advertising more than their customers do. Thus, "Most companies comfortably assume that their customers are irrational... Few companies are willing to consider the alternative possibility that at least in the long run consumption tends to be rational and that irrationality is much more a characteristic of the supplier than the consumer".

Competition: models of competition, where it is restricted to competition between a few enterprises, have been extensively developed, e.g. models of duopolies and oligopolies. However, Ackoff (op. cit; 54) points out that, "even where we can model each competitor separately, the linkage between these models seldom enables us to reproduce, let alone forecast, competitive interactions". However, Ackoff (op. cit; 55) makes the important observation that: "In pricing ... it frequently turns out that, although we may have difficulty in predicting how each competitor will respond to a change in ... pricing, the relevant response ... is quite predictable". From this it can be assumed that the pricing behaviour of firms is rational, an assumption that is maintained at the outset of the present investigation.

A further aspect of the competition system to be considered is advertising, which is considered to be an important instrument of competition (within the restrictions mentioned under "consumers", above). Ackoff (ibid) argues that advertising is used heavily where brand differences are either not perceptible or not significantly perceived - an argument that would seem appropriate for the sawmill industry. To develop advertising, and with it a knowledge of consumer behaviour, requires considerable marketing and behavioural research, the resources for which are simply not available for small firms, which must rely on opinion (informed or otherwise) and experience.

The environment: the importance of the environment should not be underestimated. As Ackoff (op. cit; 56) observes, corporate planners are "necessarily concerned with the broad social, economic political and technical context within which the firm will have to operate in the future". Thus, the environment is given considerable attention later in this paper.

Given the aim of describing small sawmills, it is necessary to find a suitable method. The investigation concerns 61 small sawmills, and these can be divided into three sets: i) sawmills which contract their services, but which do not sell sawn timber; ii) sawmills which contract their services and sell sawn timber; and iii) sawmills which only sell sawn timber, not their services. Given this a priori classification, a straightforward descriptive method, where multi-variate causal analysis is not required, is cross-tabulation. This method has the advantage of employing pairs of variables the relationships of which can be readily observed free of interference from other variables. Further, statistical tests can be applied to assess the significance of the relationships.

1.4. A DESCRIPTION OF THE SMALL SAWMILLS IN NORTH KARELIA

1.4.1. The number and size of sawmills

The material concerns 61 small sawmills in the province of North Karelia in eastern Finland. Of these sawmills, 35 (57 %) were contract sawmills, 14 (23 %) were contract-commercial sawmills and 12 (20 %) were purely commercial mills. The material concerns the sawmills' activities during 1981. Table 1.2 examines the size structure of the mills, from which it can be seen that the majority of the contract mills produce under 1 000 m³/year, with 57 % producing between 500 and 900 m³/yr. The production of the commercial mills can be seen to be generally greater.

Table 1.2. Production of sawn timber by small sawmills in North Karelia, by size classes and sawmill type

Production m/yr	Contract sawmills		Contract- commercial- sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
	under 500	8	23	6	43	3	25	17
500 - 999	20	57	4	29	1	8	25	41
1000 - 2999	7	20	4	29	3	25	14	23
5000 & over	0	0	0	0	1	8	1	2
Total	35	100	14	100	12	100	61	100

1.4.2. The firm

The attributes accredited to the firm in the above discussion are wide ranging and embrace the entire set of operational functions. Many of these functions will be discussed, albeit briefly, in the following sections.

The structural affiliations of the sawmills are shown in table 1.3. It can be seen that the great majority of the contract mills are part of farm enterprises, whereas the majority of the contract-commercial and commercial mills are independent firms. The contract sawmill can therefore be regarded as an extension of farm work, and a source of supplementary income. Table 1.4 shows the activity period of the small sawmills, and again the part-time nature of the contract mills is clearly revealed.

Table 1.3. Structural affiliation of the small sawmills industry

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Part of farm	29	83	3	21	1	8	33	54
Part of firm	2	6	0	0	0	0	2	3
Independent	4	11	11	79	11	92	26	43
Total	35	100	14	100	12	100	61	100

Table 1.4. Activity intensity of the small sawmill industry in North Karelia

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Under 1 month	10	29	0	0	0	0	10	16
Under 3 months	12	34	1	7	0	0	13	21
Under 6 months	7	20	2	14	0	0	9	15
Under 9 months	6	17	1	7	0	0	7	12
Continuous	0	0	10	71	12	100	22	36
Total	35	100	14	100	12	100	61	100

Concerning location, a number of variables were available in the main analysis. For brevity, only the location of the mills with respect to population centres are shown here, table 1.5. The table reveals a rational tendency for the commercial sawmills to be located in populated areas (administrative centres of the communes) where services and labour supply are better. The location of the contract sawmills in scattered settlement areas reflects their association with agriculture.

Table 1.5 Location of small sawmills in North Karelia

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Admin. centre	6	17	1	7	6	50	13	21
Scattered settlements	29	83	13	93	6	50	48	79
Total	35	100	14	100	12	100	61	100

The sawmill owners were also asked to consider, from a list of locational attributes, which were the most important, next important and least important. Sixty-six percent of the contract mills and 79 % of the contract-commercial mills, but only 25 % of the commercial mills gave ready buildings as the main reason for their location. Proximity to markets was not generally considered important, 17 % of the commercial mills considered raw material supply to be the most important location criteria, while for 17 % of the commercial mills raw material supply was the second most

important locational attribute. Labour supply did not feature as a systematic locational factor, although it was the second most important factor for 25 % of the commercial mills.

The average labour force of the sawmills was small. Ninety-one percent of the contract mills, 79 % of the contract-commercial mills, and 33 % of the commercial mills employed an average labour force of less than five men. Twenty-one percent of the contract-commercial mills and 17 % of the commercial mills employed five to ten men. Of the commercial mills, 17 % had 10 to 20 workers and 33 % had over 20 .

Table 1.6 Source of labour for small scale sawmills in North Karelia

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Same village	2	6	5	21	2	17	9	15
Same commune	8	23	7	79	8	67	23	37
Further afield	25	71	2	17	2	17	29	48
Total	35	100	14	100	12	100	61	100

The source of the labour force is shown in table 1.6. The large proportion of the contract sawmills labour source coming from beyond the home district can be explained by the fact that the labour during sawing most often is supplied by the owner of the wood being sawn (74 % of the contract sawmills possess portable sawmills). The

contract-commercial and commercial sawmills draw considerably more of their labour force from their home districts, although the commercial sawmills, which are larger, tend to attract labour from further afield.

Table 1.7 State aid received by smalls sawmills in North Karelia

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
No aid	35	100	3	21	3	25	41	67
Aid	0	0	11	79	9	75	20	33
Total	35	100	14	100	12	100	61	100

The contract sawmill owners were generally unable, or unwilling, to reveal details of their financial situation. The contract-commercial and commercial mills, however, had a mean capital value of 1,35 million Fmks (GBP 165 000 at current prices) and had a mean turnover of 1,9 million Fmks (GBP 222 000). Under the regional support legislation of the Finnish state, aid is available, at least in principle, to small firms. Table 1.7 shows that the majority of the contract-commercial and commercial mills have received such aid. Most of the contract mills, being supplementary to agriculture, are, however, not eligible for aid.

1.4.3. Supply

While supply concerns a number of factors, only raw material supply is now considered. Naturally, the contract sawmills do not procure sawlogs. The purchases of the contract-commercial mills in 1980/81 were entirely below 500 m³, while 50 % of the commercial mills also purchased less than 500 m³. Twenty-five percent of the commercial mills purchased from 500 to 1 000 m³ and 17 % purchased over 1 000 m³.

Concerning price, 80 % of the commercial mills, and 58 % of the contract-commercial mills considered that they had paid more than the agreed price of their sawlogs, i.e. the price agreed in negotiations between forest owners organizations (sellers) and forest industry organizations (buyers). Twenty percent of the commercial mills and 25 % of the contract-commercial mills paid the agreed price for sawlogs, but 17 % of the contract-commercial mills believed that they had paid below the agreed price. The fact that most of the mills had paid more than the agreed price has important implications for the economy of forest owners in the region, and this will be examined in depth elsewhere.

Price was not the main consideration in sawlog purchasing decisions, however. Only 17 % of the commercial sawmills owners considered that price was the most important factor, although 42 % considered price to be the second most important factor in purchasing decisions. Quality was the most important factor: 75 % of the commercial mills and 85 % of the contract-commercial mills considered quality as the most or second most important purchasing decision factor.

The sources of sawlogs are shown in table 1.8. The table omits the less important sources of logs, i.e. communes, parishes and the state. It can be seen that purchases from farms are important to both sawmill groups. Half of the contract-commercial mills purchased over 40 % of their saw timber from farms in 1981, while 34 % of the commercial

Table 1.8 Purchases of saw logs, by principal sources and sawmills types, North Karelia.

% of purchases	OWN		FARM		FOREST		COMPANY	
	FOREST		FARM		FARM		FARM	
	con-	comm	con-	comm	con-	comm	con-	comm
	comm		comm		comm		comm	
None	50	92	25	25	83	75	67	42
1 - 9	8	0	17	8	8	0	8	0
10 - 19	17	0	8	17	8	8	0	17
20 - 39	17	0	0	17	0	17	0	0
40 - 69	0	8	8	17	0	0	8	17
70 & over	8	0	42	17	0	0	17	25
Total	100	100	100	100	100	100	100	100

mills purchased over 40 % of their logs from farms. Forest farms, i.e. farms no longer engaged in agriculture, were important sources for commercial mills, supplying 25 % of the commercial mill needs. Timber supply companies, which procure logs of all assortments for the Finnish forest industries, were more important than farms as suppliers of logs to mills.

The significance of these small purchases by the small-scale sawmills to the seller, especially to the farm-owners, is not yet known, and will be examined in a subsequent phase of the investigation.

It should be noted, however, that because small sawmill owners are constantly searching for suitably small lots of high quality saw logs, the supply structure, in proportional terms, may vary considerably in the short term.

Table 1.9 Number of small sawmills, by mill type, selling sawn timber to given outlet. All mills have more than one market outlet.

Outlet	Contract- Commercial sawmills ¹	Commercial Sawmills ²	Total ³
Sold privately	11	9	20
Sold to retailer	3	2	5
Sold to wholesaler	1	3	4
Sold to factory	2	3	5
Used for own manufacturing	9	6	15
Exported	3	6	9

1) _{n=14} 2) _{n=12} 3) _{n=26}

1.4.4. Distribution and sales

The sales outlets of the sawmills' products are shown in table 1.9. A diversity of outlets will be observed. From the standpoint of local development, however, the export of sawn timber is the least desirable market alternative. This is because of the forward linkages leave the region. The analysis reveals that 33 % of the commercial sawmills exported over 70 % of their sawn timber production. On the other hand, the contract-commercial mills exported only a small proportion of their production. However, 64 % of the contract-commercial mills used varying proportions of their sawn timber production for their own further manufacturing, compared with 50 % of the commercial mills. This further manufacturing is an important local development process, and will be the subject of further investigation.

Table 1.10 Average distance to markets of small sawmills in North Karelia

Distance km	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Under 10	3	9	0	0	0	0	3	5
10 -19	8	23	2	14	0	0	10	16
20 - 39	13	7	8	57	3	25	24	39
40 - 79	7	20	4	29	4	33	15	25
80 & over	4	11	0	0	5	42	9	15
Total	37	100	12	100	12	100	61	100

Distance to markets, table 1.10, and mean transportation distance of sawn products were the two variables employed to measure distribution. The variables gave a consistent result. The commercial mills can be seen to extend their sales beyond the region, the contract-commercial mills operate on a smaller scale and serve the more immediate region.

1.4.5. Competition

Competition is here briefly considered on the basis of two variables: the determination of product price, and marketing activity. Two aspects of Ackoff's arguments are therefore covered, and are in fact disputed. Ackoff argues that pricing is predictable. The evidence here suggests otherwise. Entrepreneurs were asked who they considered set product price. Their replies revealed the independence of the contract mills, 100 % of whom considered that they set their own price. The contract-commercial mills, on the

other hand, were divided; 38 % considered that product price was set by the large firms, while 61 % claimed that they set their own price. The commercial mills were more precise, 25 % replied that the large mills dictated the market price, while 25 % followed a common agreement between the small sawmills owners, and 50 % claimed to set their own price.

As for marketing activities, it has been argued that where brand differences are either not perceptible or not significantly perceived advertising will be heavy. The results obtained here do not altogether support this argument. As might be expected, the contract mills did not undertake marketing activities. Marketing activities were carried out by 57 % of the contract-commercial mills, and 67 % of the commercial mills. Thus, marketing activities increase with the entrepreneur's increasing dependence on sawmill production. The extent of active marketing by the sawmills is shown in table 1.11.

Table 1.11 Extent of active marketing by small sawmills

Extent	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Own village	2	5	1	7	0	0	3	5
Own commune	8	24	2	14	0	0	10	16
Neighbouring communes	17	49	5	36	4	33	26	43
Further afield	8	23	6	43	8	67	22	36
Total	35	100	12	100	12	100	61	100

1.4.6. Behaviour

Entrepreneurial behaviour will be considered in depth later in this paper. Suffice it to note here that despite the difficulties now facing the Finnish wood working industry as a whole, the small sawmills which are the subject of this report appear to give satisfaction to their owners, as can be seen in table 1.12. This result supports the intuitive a priori assumption that small-scale entrepreneurs are frequently satisficers and do not seek optimum solutions or profit maximization.

Table 1.12 Degree of business satisfaction among small sawmill owners, 1981

	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Dissatisfied	1	3	2	14	3	25	6	10
Satisfied	26	74	11	79	7	58	44	72
Cannot say	8	23	1	7	2	17	11	18
Total	35	100	14	100	12	100	61	100

2. FRAME OF REFERENCE

2.1. The Entrepreneurial element

It has already been noted that in order to explain the location and behaviour of entrepreneurs in depressed areas in Finland it is necessary to relax many of the assumptions of neo-classical location theory. This necessity has been particularly well demonstrated by Wolpert (1964). Similarly, regional economic development theories often include in their structure aspects of regional dynamics, spatial diffusion and technical progress. However, the presence and mobility of entrepreneurs as a factor in regional development has been neglected in regional development studies. This is because, according to Richardson (1969:316-320), i) static equilibrium theory assigns no role to entrepreneurs, and ii) the impossibility of incorporating the entrepreneurial factor in a determinate theory. Regionalism is also an important consideration, because the economic, social and cultural development of a region in the recent past will be reflected in the present opportunities for entrepreneurship and the demand for managers. Richardson (ibid) points out that the efficient allocation of resources will normally require the migration of managers from some regions to others, especially where there is a differentiation of regional growth rates. There is, however, no guarantee that entrepreneurs will migrate. A region perceived as being of low economic potential will probably not attract managerial skill from regions perceived as having greater potential. The poorer regions must therefore rely on their natural stock of entrepreneurs. It is, to a large extent, this natural stock of entrepreneurs which is the subject of the present investigation. It is evident that many entrepreneurs are prepared to remain in areas of lower economic growth despite the possibility of moving to regions of higher economic growth. To explain this, Richardson (ibid), for example, argues that entrepreneurs possess strong locational preferences for living in a certain place:

In many cases there is a psychic income element attached to an accustomed environment, and this means that entrepreneurial locations have to be stated in terms of maximizing satisfaction rather than in terms of maximizing salary or profits.

The question of satisfaction will be discussed in more detail in due course, but it needs to be born in mind that psychic values are not easily measured, and model-building on the basis of such values is indeterminate. This having been said, the investigation will nevertheless proceed on the assumption that humanistic aspects of the entrepreneurial function are central to the location and activities of small-scale industries and that humanistic attributes can be measured.

2.2. Philosophical considerations

The assumption that humanistic aspects of entrepreneurial behaviour are central to the study of small-scale entrepreneurial activities requires further discussion before proceeding to a more detailed account of the frame of reference. A requirement of positive science is that the scientist should be objective and "value free". But as already indicated above, the present investigation adopts an indeterminant, humanistic approach. Thus, because of the basic assumptions made, the separation of fact and value will not always be possible. A purely positivist approach is therefore abandoned at the outset. It might be argued that the refusal to separate fact and value brings the investigation close to philosophical standpoint of the phenomenologist or even the existentialist, cf. King (1979;202), Buttimer (1979;19-20) and Johnston (1983;52-86). Buttimer (op cit), for example, argues that

Existentialism offers... a perspective on the quality and meaning of human life in the discrete everyday world. Its epistemological foundations stem largely

from the phenomenological critique of objectivism and scientific theory, so it speaks of lived experience in the language of meaning, and tries to make values explicit.

The methodological problems stemming from such an approach are discussed by, e.g., Johnston (1983:56ff). Johnston, following Spiegelberg (1975), outlines approaches which have been adopted so far. One such approach is imaginative self-transposal, which requires that the investigator imagines himself occupying the place of the subject, and that the investigator adopts, as much as is possible, of the frame of mind of the other person. Another approach is interpretive understanding, or *verstehen*. This concept is associated with hermeneutics, which seeks to interpret the meanings behind actions. The concept is also associated with Dilthey (1833-1911) cf. Rose (1981), and it seeks to understand peoples' actions in terms of their situational context. This concept comes particularly close to the position adopted at the start of the present investigation.

Hahtola (1973:14), writing on the decision-making processes of forest owners, reminds us that the strict separation of values and facts, and the special philosophical status of mental variables, are corollaries of the separation of mental and physical phenomena. Values, therefore, are conceived as subjective preferences or as conventions, but while they are empirically observable and describable, they are not legitimized facts. As non-legitimized facts they are not acceptable for analysis according to the positivist philosophy. However, Hahtola (*ibid*:16) considers that in trying to understand the ways of thinking of a given group of humans it is necessary to empirically investigate their mental variables, and not to just assume them. Hahtola therefore argues that the most promising approach to the problem stems from offering equal philosophical status to both mental and physical phenomena. It is now contended that such an approach is in line with phenomenological

humanistic research, so that following Dilthey (Rose, op cit.), the phenomenological concept of meaning is introduced into the situation context.

Thus, while the present investigation possesses certain methodological linked with positivism, notably in the methods employed in the empirical analysis, the present investigator follows Gidden (1976, see Johnston 1983:65) in considering that humanistic research, being interpretative, starts from a base in phenomenology and hermeneutics to present a view of the world as it is perceived by the subjects and not as structured by a priori models constructed by observers. This having been said, it is also realized that behavioural work only goes part of the way in achieving phenomenological and hermeneutic objectives because it is so deeply rooted in positivism (cf. Mercer & Powell 1972, Cox 1981, Ley 1981 and Johnston 1983). Indeed, it has been argued that a purely humanistic approach to replace positivism is impossible (Entriken 1976:616). The humanistic approach to problem solving will therefore be a compromise between phenomenology, idealism or some other humanistic philosophical standpoint, and positivism. The humanistic approach can therefore be expected to be eclectic in its philosophical origins, in its theoretical bases and in its methodology. The mix is, in fact, a matter of intuition and imaginative interpretation on the part of the investigator. This eclecticism will be very much in evidence in the following discussion of the frame of reference for considering the behaviours of entrepreneurs in rural areas.

2.3. On behaviour and values

The behavioural approach to the examination of small-scale entrepreneurs in rural areas has utility because, to follow Muir and Paddison (1981:17), the behaviouralists' main interest lies in examining the events underlying decisions which lead to spatially observable patterns. Muir and

Paddison (ibid:18) succinctly define the central tenet of the behaviour approach thus:

The central tenet of the behavioural approach is what determines spatial patterns in man's appreciation of his environment and his behaviour in it. Rather than reactions to the real world, man's action are responses to a "smaller" world, one which he perceives, his perceptions being an amalgam of his values and attitudes, his inherited cultural traits. Their effect is to channel his attention to certain features of the environment so that given the same physical environment the responses of two individual (or two social groups) can well vary. Opportunities (e.g. economic resources) recognized by the one may go unrecognized by the other.....

Muir and Paddison here follow Kirk (1963) who has been a pioneer in cognitive behaviouralism in geography. Kirk considered the behavioural environment to be distinct from its phenomenal counterpart. The latter constitutes the totality of human and natural systems, but the behavioural environment is the environment as it is perceived. It has also been recognized that perception by the individual is influenced by social and cultural circumstances, cf. Cassirer (1959), Lenneberg (1962) and Caws (1965) (in Harvey 1969:18-22). According to Caws (op cit) the individual is located at a "subjective pole of experience" which determines the individuals percepts, concepts and terms and thus his perceptions, thoughts and language. These determine, following Kirk, how the individual perceives his world.

According to Bourne (1973, quoted in Muir and Paddison 1981:19) behavioural studies fall nowadays into three main groups: i) analysis of the spatial outcomes of individual and group behaviour patterns, ii) the decision and decision-making processes, and iii) the preconditions of

these decisions, particularly with respect to how people view their environment. The role of the environment is therefore seen to be an important part of the behavioural approach. Thus according to Muir and Paddison (1981;23):

Any decision can be traced backwards to two principle groups of "influence variables", i.e. those relating to the environment and those relating to a set of predispositions which determine the decision-makers orientation.

The predispositions follow from the value systems created by culture (learning) and by the philosophical and psychological make-up the individual, i.e. predispositions relate to personality types. Aspirations, for example, are a learned behavioural response dependent upon cultural values. This is illustrated by Ullrich (1972;33-4) who points out that learning plays various roles in an individual's establishment of levels of aspirations:

Education dictates both the character and quantity of success and individual will "try for" in a given situation. Yet it should be clear that past learning affects present and future aspiration levels in a manner which is not readily apparent in all laboratory demonstrations. Families of orientation, reference groups, and social norms are not omnipresent in a physical sense, but they are in a psychological sense....

Consequently, modes of behaviour emerge which tend towards consistency with respect to the individual's life space, so that peers become genuinely surprised when an acquaintance "acts out of character". Further, the learning process, concerned as it is with isolated and often seemingly independent facts and perceptions in the short run, leads the individual to the construction of sets of generalizations from the discrete information stored in the

mind. From these generalizations individuals develop opinions concerning the nature and value of things, and the meaning of existence itself (cf. Ullrich op cit; 35). For example, all people have opinions about religion. Ullrich (ibid) therefore writes

In addition to religious philosophies, most normal individuals have opinions about the correct role of the state in the area of social welfare, the nature of the ideal form of political and economic government, the nature of the proper relationship one should affect with one's fellow man, the proper role of education in society, and so on. Taken together, these opinions form a fairly comprehensive, although possibly naive, system of philosophical thought.

These naive philosophies may be very inconsistent, illogical, ill-defined or inexplicable, but it is argued that they can be seen as identifiable structures of thought which, in the long run, have a degree of consistency.

The creation of value system depends on a balance of basic attitudes in each individual (cf. Spranger 1928, Allport 1961, McCurdy 1961 in Ullrich, op cit.). The basic attitudes are normally present in the individual in different strengths. Taken separately, however, they enable the description of idealized basic attitudinal types, or basic types of man, although in reality these types of men never actually occur. It can be expected, however, that one of the attitudinal types will be dominant in each individual, but the characteristics displayed will only approximate to the ideal type. The basic attitudinal types (types of man) are summarized as follows (cf. Ullrich, op cit; 38-41).

1) Theoretic man (the theoretical attitude): this is man the
scientist, a lover of knowledge free of judgements; he

seeks objective knowledge for solving problems, to formulate correct equations, and to learn.

- 2) Economic man (the economic attitude): knowledge has value only where it is applicable to his quest for self-preservation. Fellow men are seen in economic terms - as producers and consumers. Wealth is a source of control over people and nature which can be gained by competition. It is to be noted that Spranger's concept of economic man differs somewhat from the concept of economic man in normative economic theory.
- 3) Aesthetic man (the aesthetic attitude): nature is viewed not as a set of facts, but as a living entity of quasi-mythological stature. Beauty is the ultimate value in life.
- 4) Social man (the social attitude): what beauty is to the aesthetic man, love is to the social man. The social man lives through others rather than as an independent entity. The social attitude translates into communism in its idealistic form.
- 5) Political man (the political attitude): the political man is consumed with the will to dominate others. All other value systems are brought to bear by him in his quest for personal power.
- 6) Religious man (the religious attitude): the religious man relates to an ultimate value which is not of this world. He may take the form of a transcendental mystic or of an imminent mystic.

Psychological tests based on Spranger's idealized types of man have yielded results to the effect that individuals, not surprisingly, differ considerably with respect to their value systems, but more importantly, Ullrich (op cit;42) concludes that

Value systems possessed by individuals are related to their ways of living in such a manner that one is led to infer that the latter are in part determined by the former.

The implication is, therefore, that cultural background plays a significant role in determining the life-philosophies of individuals. Taken together, life philosophies and value systems create psychological needs in the individual which he attempts to satisfy. The individual's awareness of these needs is prompted by cues from the cultural environment.

2.4. On socio-economic environments

The environment in the present discussion refers to the environment for small-scale entrepreneurs in rural areas. Both economic and social environments are therefore of concern. Myrdal's theory of circular cumulative and causation, and its modifications to Finnish conditions by, e.g. Riihinen 1965, Hahtola 1973 and Selby 1981, offers a tried method for describing socio-economic environments. Hahtola's extension relates the theory to rural circumstances, and it was this version which was applied to a spatial hierarchy by Selby 1980 & 1981. Myrdal's theory has also been usefully combined with social structure conceptual systems, cf. Järveläinen 1971 and Selby (op cit.). In this way socio-economic development can be linked directly with levels of social development.

Thus, according to Myrdal, the accumulation of economic activities in prosperous, growing regions influences the less prosperous ones in two ways. In regions with spread effects, benefits are derived from the growth regions by the stimulation of demands for raw materials and foodstuffs, and the rapid diffusion of innovations. Regions adjacent to growth centres frequently receive spread effects, but distant locations may also benefit if

favourable conditions exist for producing raw materials for the growth centres. Such localities may attract sufficient economic activity to become new growth centres.

The second way in which growing regions may effect the less prosperous ones is entirely negative. Regions with backwash effects suffer as the result of the development of growth centres. The net movements of population, capital and goods favour the growth areas. These movements "are the media through which the cumulative process evolve upwards in the lucky regions and downwards in the unlucky ones." (Myrdal 1957:27). Rural regions lose population to the growth centres and consequently suffer a deterioration in the age structure of the remaining population, a deterioration which is often aggravated by high fertility in the lower economic and social strata.

Capital and trade developments also operate with a fundamental bias toward the growth areas, as the market system works to the advantage of those areas. The poor regions, lacking savings, capital investments and established industries, remain dependent upon agriculture and forestry (Myrdal 1957;28-29).

Myrdal argues that social factors are also important in the cumulative process towards regional inequality. All relevant adverse changes which originate outside a region - the backwash effects - are effects which occur by way of migration, capital movements and trade, but they are also effects which occur via the whole spectrum of social relations (Myrdal 1957;30-31).

Indeed, the role of social relations within a region are of considerable importance in forming social attitudes towards socio-economic change and innovation. In this context it is useful to consider two related conceptual systems for describing social structures. These are the

Gemeinschaft-Gesellschaft concepts put forward by Tönnies (1887), and the Traditional-Modern concepts of Rogers (1968).

Tönnies refers to the traditional social environment as Gemeinschaft, in which society is based on kinship and friendship. Such a society is characterized by:

- a low level of division of labour and a lack of occupational differentiation;
- strong family ties and the importance of personal interaction;
- a strong pressure to conform to social norms;
- a poorly developed communications media.

Gesellschaft, on the other hand, represents industrial society, in which society is based on shared interests and mutually recognizable targets. It is characterized by:

- an advanced division of labour, occupational differentiation and division into sectors;
- the importance of formal (institutional) organizations;
- reduced pressure to conform to social norms;
- a well developed communications media.

Rogers's division of societies into Traditional and Modern is based on societies' degree of acceptance of innovations. Traditional and modern societies are considered to be the extremes on a continuum of innovativeness. A social system adhering to traditional values is considered to be characterized by:

- underdeveloped technology, with agriculture and forestry being the main employers;
- a low level of education, with communication being restricted to the personal level;
- a low degree of interaction with other systems;
- a lack of economic rationalization. Primary group

- interests have a value in themselves and are not a means of achieving certain goals;
- a lack of empathy.

Conversely, a society with modern values is characterized by:

- advanced technology and a marked division of labour;
- an appreciation of science and technology;
- strong interaction with other social systems facilitating the spread of innovations;
- planning and economic rationalization leading to the choice of optimum means for achieving goals;
- empathy.

These two conceptual systems therefore present the ends of social typological continua, although in fact they can be considered to be different descriptions of the same continuum. It is not expected that these extreme typologies will be met in practice, especially in Finland, but these typologies never-the-less provide reference points which aid the identification of the structural elements of the social environment.

It might be assumed that regions (or localities) exhibiting traditional, or Gemeinschaft characteristics are poor locations for industry. The basis for this assumption is the strong relationship between traditional societies, primary production and low levels of economic development. This relationship is, for example, incorporated in Myrdal's theory of circular and cumulative causation, outlined above, which has received considerable empirical support from investigations by e.g. P.Riihinen (1963), O.Riihinen (1965) Hahtola (1967 & 1973), Järveläinen (1971) and Selby (1981). Lazarus (1966:424), however, is of the opinion that "economic depression", which may be stressful at the general societal level, may not automatically lead to psychological stress at the

individual (or firm) level. Following this argument, Pred (1969;89) points out that not all members of a given population of "location actors" will necessarily lapse into "stress reaction" in the event of negatively changing environmental parameters, i.e. backwash conditions. Pred argues that many such actors (entrepreneurs) "will make the best of things" acting in such a way as to survive and so acquiring experience which will open the possibility of more rational adaptability in the future. Further, Ohlin (1933;236, cf. Pred 1969;23) observes that the ability of a locality to hold an industry greatly exceeds the original ability to attract the industry. Further, market conditions will, according to Pred (1969;23) tolerate a limited number of operating units, volume of production, sales or movement. Morrill (1965;7) also notes that over a period of time there are many more possible locations for plants than plants to establish.

The above arguments are particularly relevant when it is considered that socio-economic development or decline are dynamic processes - the situation at any given time being either in a condition of flux or rest. If at rest, the system is inherently unstable. Thus, in a given situation the environmental parameters may support the growth of a particular industry. Later, the parameters may change and the spiral of circular and cumulative caustation progresses upwards or downwards. In the case of a downward spiral, economic backwash may result, but following the argument of Lazarus (1966) and Pred (1969) under such conditions entrepreneurs will frequently lower their aspirations and "make the best of things".

Pred (1969;109) considers the effect of changing environmental parameters further, and is of the view that most parametric "shocks" in the industrial location process originate in the economic, technological or political environment, and that they fall into two categories: those affecting production and related costs;

and those radically transforming demand. For example, a considerable parametric shock may be administered to small-sawmills when out-migration of the economically active population from a region or locality suffering from backwash effects results in a serious decline in the local demand for sawn timber, as well as increasing the difficulties in obtaining saw timber because of the shortage in forest labour.

Turning now to affect of the social environment, it can be expected that in traditional societies, i.e. Tönnies' *Gemeinschaft*, the social norms, the restricted division of labour, etc, do not create the ideal environment for entrepreneurship. Pred (1969;51) supports Hagen (1962;8-9) in pointing out that the imprint of traditional societies on personality types may well discourage innovation behaviour in the entrepreneurial population as a whole thereby preventing the increase in entrepreneurial information as well as the ability to use information. Pred (1967;90) also points out that "psychological ties to place, desire for social approval and other "personal" and non-economic reasons are frequently consequential decision determinants." Localities and neighbourhoods may become "change resistant".

Thus,

the "authoritarian" personality of a traditional society which is not undergoing a transition to economic growth is uncreative, or unwilling to undertake any pioneering innovational action (locational or otherwise) that will serve as a model to others (Pred, 1969;51).

In this environment the locational actor, according to Pred (op cit)

perceives the world as an arbitrary place rather than an orderly one amenable to analysis and responsive to

his initiative.

Pred supports March and Simon (1958;139) in the view that subconscious censorship mechanisms - the product of the "internalization" of the values and sanctions of traditional societies - prevent a creative response in the entrepreneurs when they are exposed to information stimuli (events or ideas). Further, Hagen (1962;98 - quoted by Pred 1969;51) is of the opinion that in traditional societies the entrepreneur avoids anxieties caused by facing unresolved situations (new alternatives) in the physical world by reliance on the judgement of authority (as created by the traditional social norms).

The traditional social environment would seem to impose restrictions on the entrepreneur preventing him from exercising his free will. He is therefore controlled by exogenous forces created by his environment. If this state of affairs is accepted then the argument presented for the influence of the social environment on the entrepreneur can be considered to follow a deterministic cause-and effect language. However, this argument will be disputed in section.

2.5. On rationality, motivation and satisfaction

It is assumed that the entrepreneur is able to exercise his free will over the endogenous processes in his firm. Given this possibility the entrepreneur is able to make decisions regarding the location and operation of his firm. In this respect, it is common in economic theory to consider the entrepreneur, and the operation of his firm, as entirely rational and in possession of single and restricted goals, such as profit maximization or cost minimization. This rational entrepreneur, often referred to as "economic man", is essentially based on normative concepts. Thus, to quote Wolpert (1964;537), economic man, being perfectly rational

is free from the multiplicity of goals and imperfect knowledge which introduce complicity into our own decision behaviour.

There is, however, a growing application of behavioural theory, concepts and generalizations to the analysis of variations in economic behaviour, the aim of which, according to Simon (1957;24), is

to replace the global rationality of economic man with a kind of rational behaviour that is compatible with the access to information and the computational capacities that are actually possessed by organisms, including man, in the kinds of environments in which such organisms exist.

One such behavioural concept which is demonstrably viable (cf. Wolpert 1964 and Pred 1967 & 1969) is the principle of "approximate" or bounded rationality, according to which man is intendedly rational with respect to his own perception of reality, but this perceived reality only approximately relates to the real world (Simon 1957b;241-260). The principle stems from Brinkmann (1935) who pointed out that optimal location theories, such as von Thunen's *Der Isolierte Staat*, fail to take into account the influence of farmers' (entrepreneurs') personal qualities upon the location of production. Brinkmann considered "personal qualities" to be a factor of production, but whereas he accepted the profit maximizing assumption, Simon (1959;262) clearly rejects it:

The entrepreneur may not care to maximize, but may simply want to earn a return that he regards as satisfactory.

The principle of bounded rationality rejects the "classical" concepts of rationality. In Simon's words

(1957b:246)

... in the absence of evidence that the classical concepts do describe the decision-making process, it seems reasonable to examine the possibility that the actual process is quite different from ones the rules describe.

Simon (ibid) therefore introduces

some modifications that appear (on the basis of causal empiricism) to correspond to observed behaviour processes in humans, and that lead to substantial computational simplifications in the making of a choice. There is no implication that human beings use all of these modifications and simplifications all the time.

Man is therefore considered to be a sufficer not by choice, but because he possesses bounded rationality. Again following Simon (1957a;XXIV)

human beings...suffice because they have not the wits to maximize.

McGuire (1964:182) argues that the concept of sufficing man differs from that of maximizing man in that

Constraints, both "internal" and "external" limit the global rationality and consequently the decision processes and behaviour of the latter.

One means of simplifying the study of complex choice situations employed by Simon is the computation of "simple" pay-off functions. In this approach it is, for example, necessary to assume that the pay-off, representing "value" or "utility", assumes one of two values (1,0), which might be interpreted as satisfactory

or unsatisfactory. The determination of these values is discussed in detail by Simon (op cit;246-248, 257-260). In summarizing Simon's discussion, suffice it to refer to the definition of the delimitation of "satisfactory" or "unsatisfactory" pay-offs (ibid):

In psychological theory we would fix the boundary at the "aspirational level"; in economic theory we would fix the boundary at the price which evokes indifference between selling and not selling (an opportunity cost concept).

In classical economic theory a complete ordering of pay-offs derived from optimal solutions is required. However, the decision maker is unlikely to have sufficient information or ability to decide which is the "best" pay-off but, according to Simon (op cit;250) he will be sensitive to "good" pay-offs. Further, for a group of persons the pay-off functions preferred by each individual may differ from the functions preferred by each other individual. Or, in the case of an individual, a number of values may have to be considered which do not have a common denominator. For example, the entrepreneur may compare two alternative life styles in terms of salary or profit, pleasantness of work, self-fulfillment, prestige, climate, environment, etc. Thus pay-off solutions will have several components, each of which will be judged by the decision maker in relation to his aspirational levels, and given a set of satisfactory solutions to each pay-off component, a minimum guaranteed pay-off may be accepted (see Simon, op cit;251-2).

Satisfaction can also be discussed in terms of contributions and inducements expressed as utilities to the individual, cf. McGuire (1964;176-7). However, while the inducement component can be expressed in monetary terms, the utility of a contribution must be expressed in more abstract terms. Thus, following March and Simon

(1957;85) the utility of a contribution can be defined as "the value of the alternatives that an individual forgoes in order to make the contribution". When inducements exceed contributions, the individual's satisfaction also increases, and continues to expand as the difference between inducements and contributions grows. This is demonstrated in figure 2.1 (a simplification of the Bernard-Simon model).

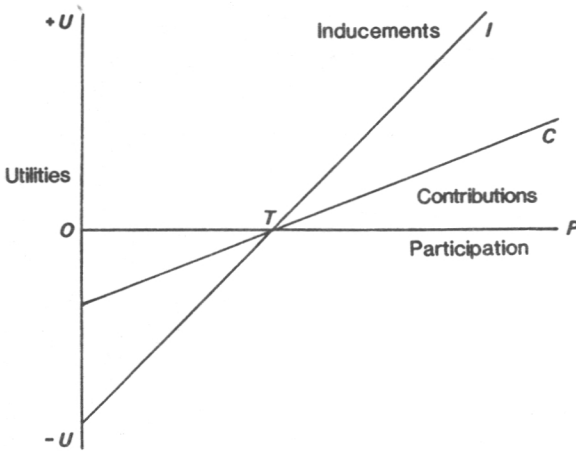


Figure 2.1 The Barnard-Simon model of organizational equilibrium (from McGuire 1964; 176-177)

Below the line OP, which represents zero satisfaction, the individual is increasingly dissatisfied, while above the line, the individual is increasingly satisfied. His participation is terminated (e.g. he resigns his job, changes his occupation, etc.) when P, I and C intersect at the vertical axis, (i.e. when the vertical axis is located at T). McGuire (op cit.) points out that in the short-run the individual may tolerate dissatisfaction, but the dissatisfaction prompts the search for alternatives. The simplification of the model as presented in figure 2.1

includes the ignoring of certain behaviours. For example, individuals (to follow March and Simon) have differing perceptions of satisfaction itself, the viability of alternatives, alternatives to movement, and ease of movement. Individuals also possess differing abilities to search for alternatives.

It cannot be assumed, however, that the individual will tolerate a continual increase in contributions even when rewarded by greater and greater inducements. The utility to the individual of contributions will reach a limit as the individual begins to compare alternative life styles, i.e. life styles which are not geared to contributions. The individual's view of, and evaluation of these alternatives will depend very much on his personality and life philosophy, i.e. his predispositions, as discussed earlier in this paper. If this argument is accepted, the satisficing concept outlined above requires modification. Rather than man being a sufferer through lack of ability to maximize, the sufferer may be viewed as having made a conscious, and to him rational, decision to limit his contributions thereby forfeiting further increases in inducements. His decision will be motivated by his conscious objection to the loss of participation in the alternatives foregone (e.g. leisure) in order to contribute to the increase in inducements. Thus, following figure 2.1, contributions will not continue to rise. There is a utility limit beyond which contributions will stabilize. Similarly, inducements may reach a limit deemed to be satisfactory. This limit of satisfaction may be predetermined by the goals set, or it may be set by the individual's refusal to participate in increased contributions, i.e. by his perceived loss of utility in forgoing alternative life styles. This perceived utility will again vary from individual to individual according to personality types.

Two further arguments need to be considered at this

junction. First, the satisficing entrepreneur having set his aspirational levels according to his experience and circumstances may, in the event of either failing to achieve his expectations or failing to meet some or all of his minimum guaranteed pay-offs, react in the face of justifiable or unjustifiable regret about a set of decision which are perceived as having brought about the failure to attain the set aspiration levels. This reaction is recognized and described by dissonance theory (cf. Festinger et al. 1964). Thus, to the entrepreneur facing disappointment (according to Festinger, op cit;98)

all negative aspects of the chosen alternatives and all the positive aspects of the rejected alternatives become salient... In other words, immediately after the decision the person (or firm) focuses his attention on the dissonance that exists and attempts to reduce it.

Pred (1969;39-40), following Festinger, points out that dissonance reduction

entails informational exposure which should, but not always, enriches the information base of the next decision process. There is, however, a strong tendency for the dissonant (entrepreneur) to seek information that supports his choice, and to avoid exposure to information that would disparage his choice.

In other words, the entrepreneur is likely to be defensive about past decisions that have led to unsatisfactory results.

The second, and related, argument concerns entrepreneurial motivation, a behavioural aspect of decision making that has received the attention of psychologists, cf. Festinger (op cit.), and Atkinson (1957), Lewin (1944) and

Siegel 1957 (quoted in McGuire 1964). Atkinson, for example, has introduced a model of resultant motivation which deals with both the motive to achieve and the motive to avoid failure. The latter can be considered to be particularly relevant to "closed" traditional societies where certain entrepreneurial activities may strain local economic and social norms. Atkinson's model (discussed by McGuire 1964;212-4) is as follows:

$$\text{Resultant motivation} = (Ms \times Ps \times Is) + (Mf \times Pf - If)$$

where:

- Ps = Subjective probability of success
- Pf = Subjective probability of failure
- Is = Incentive value of success
- If = Negative incentive value of failure
- Ms = Achievement motive
- Mf = Motive to avoid failure

Thus McGuire, following Atkinson, notes that

if the achievement motive (Ms) is greater than that to avoid failure (Mf) for a person, it is likely that he will desire a task of moderate difficulty, that is where $Ps = .50$. At this point the uncertainty of the outcome is greatest, for as the tasks become too difficult the subject becomes more convinced he will fail...a person with a strong achievement motive should...set his level of aspiration so that he...maximize(s) his anxiety about failure.

On the other hand, the person

in whom the motive to avoid failure is stronger should select either the easiest of a set of alternatives or he should be extremely speculative and set his goal where there is virtually no chance of success. These are activities which minimize his

anxiety about failure.

The motivation to avoid failure, in traditional societies in particular, stems from the fact that the entrepreneur is tending to exert his own will, and is not conforming to a norms imposed by society which reflects past traditions and customs and stresses stability, but which promotes human stagnation. These social characteristics are a feature of the Gemeinschaft-type society where strong family ties and importance of personal interaction facilitate the imposition of norms and prevent empathy.

2.6. On environmental potential

At this juncture it is possible to begin to bring together the various aspects of behaviour and attitudes discussed above and to consider them with respect to the socio-economic environment. The basic attitudes and behaviours of individuals have been given attention in this discussion because they are related to the individual's goal-setting, willingness to strive for goals, and thus their level of satisfaction.

It is now argued that the environment and goals are interrelated. Thus, according to Ullrich (ibid:54)

the need-fulfilling reward an individual can attain from an environment is a function of the activity level he is able to engage in and the total reward content of the environment.

The implication of the statement is that the individual may exercise his free-will in the degree to which he may set goals and strive to achieve them, but that the goal-setting is ultimately constrained by the environment. This would seem to support a deterministic argument, but it will now be demonstrated that this is not the case.

Ullrich (ibid;54-56) formulates a model for the determination of environmental potential

$$P_{a1} = f (P, a1)$$

$$P_{a2} = (P, a2)$$

· ·
· ·
· ·

$${}^O P_{ax} = f (P, ax)$$

Where, quoting Ullrich

Using the symbol P to denote total attainable reward and the subscript ax to denote activity level, it is possible to express an environmental potential as a point on a continuum. P_{ax} is the maximum reward the individual can possibly attain in an interaction with the environment. Thus the environmental potential has been denoted a ${}^O P_{ax}$.

This environmental potential is further defined as "the maximum outcome of a future interaction between the individual and an environment as perceived by the individual", and the environment is defined as "a sector of the individual's life space which is perceived by him to be relatively discrete from and dissimilar to all other sectors". The level of activity, i.e. the "contribution", is "the quantity and quality of effort an individual invests in a given pattern of goal-directed behaviour".

The environmental potential and the environment are, then, based on perception, i.e. on being aware. Perception in the individual is, however, a multidimensional product of cultural background, education and experience, as well as the psycho-philosophical make-up of the individual, i.e. his personality type. The workings of learning and behaviour processes have been studied in detail, especially by the philosopher-psychologist Piaget. Piaget

sees man as having a basic intellectual function composed of two parts; one part deals with assimilating new material into a existing schema; the other part accomodates the scheme to the real world (cf. Boden 1979). Thus Piaget attributes man with an innate ability to assimilate and accomodate. Ability forms the initial structure, while learning and behaviour take place within this structure which is continually transformed by experience (cf. Johnston 1983:91).

Following this agument, the restrictive norms and values of the traditional or Gemeinschaft-type society will tend to predetermine both the schemas and the assimilation of new material (learning) of members of society, as well as determining, by norms and values, how schemas are transformed by experience. For example, given the individual's interaction with his environment, the traditional society, with its low division of labour, strong personal ties and limited interaction, strong pressure to conform, a low level of education and poor communications, as well as a general lack of societal goals, will offer the individual little "new material" for assimilation. The norms will have predetermined the schema, and the limited environment will have offered limited experiences thus restricting the need to accomodate schema to reality. The individual will therefore perceive a narrow and restricted world which at the same time forms the perceived environmental potential. The individual who perceives a greater environmental potential and who is prepared to increase his level of activity to utilize that environment is likely to suffer sanctions for breaking the social norms. The individual faced with this dilema must either lower his aspirations with respect to his use of the potential environment or move to a society where his activities will not conflict with established norms. In other words, the potential entrepreneur may be required to leave his restrictive home environment in a backwash community and move to a more

dynamic community which exhibits growth, or at least spread effects.

It has been established that the more experience, and by implication the more knowledge and ability to use knowledge the individual possesses, the more accurate his understanding of the world, i.e. the less approximate and simplified is his model of reality. Pred (1967&1969) has modelled this phenomenon by means of a behavioural matrix relating the entrepreneur's location to his knowledge and his ability to use that knowledge, figure 2.2.

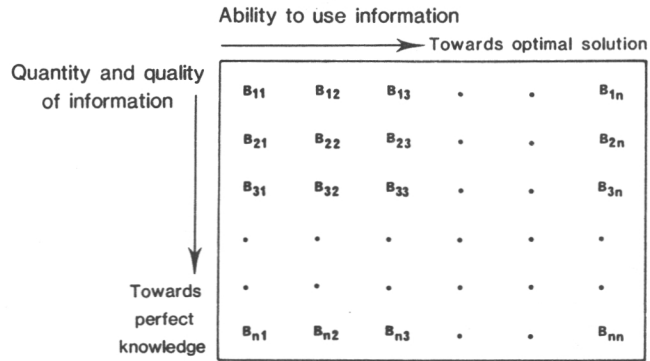


Figure 2.2 The behaviour matrix concept (after Pred 1967)

According to the model, an entrepreneur with little knowledge and little ability to use that knowledge is situated at the top left of the matrix. Such an entrepreneur will only survive by e.g. possessing few aspirations and/or having a very low level of satisfaction. The optimizer, on the other hand, will seek to maximize his knowledge and his ability to use knowledge, and will locate at the lower right of the matrix. However, knowledge and ability to use knowledge can be considered to be influenced by cultural circumstances. In a traditional society, for example, innovation may be considered socially unacceptable. The authoritarian nature of that society therefore restricts

the values and perceptions of the individuals in that society, the world therefore seems, recapping Pred (1969:51), an arbitrary place, rather than an orderly one which responds to analysis an initiative.

Pred's model is dynamic in that allows for changes with time in the environment. Catastrophies or innovations may cause the parameters of the matrix to shift. The individual may therefore be suddenly relocated on the behaviour matrix. Pred calls such shift in parameters "parametric shocks", figure 2.3.

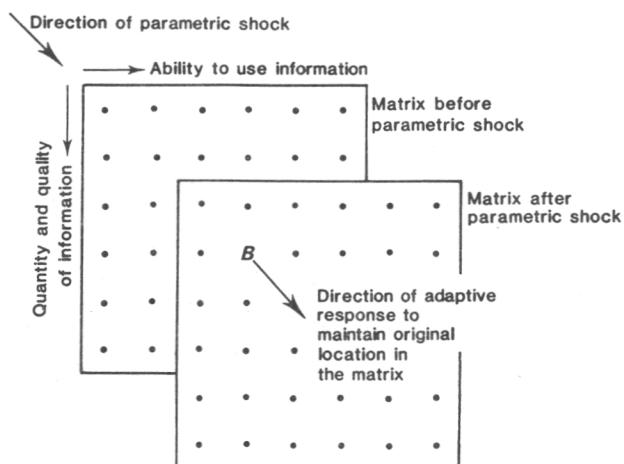


Figure 2.3 The effect of parametric shocks to the behaviour matrix

The shock may be advantageous or disadvantageous to the entrepreneur, e.g. the individual may, in the new situation, find himself with more or less information and/or ability to use that information. Let us assume, in figure 2.3, that an entrepreneur located at letter B on the original matrix is satisfactorily located with respect to the quantity and quality of information and his ability

to use that information. After a parametric shock the origin of the matrix is relocated, and the entrepreneur's location at B weakens with respect to both the quantity and quality of his information and his ability to use that information. To regain his original location in the matrix he must actively seek more and better information and learn to use the new information. However, Pred's model may be viewed in a different way. Rather a than parametric shock shifting the individual's location on the matrix, there may be parametric maxima, determined by the social environment, beyond which the individual may not go without incurring sanctions, figure 2.4.

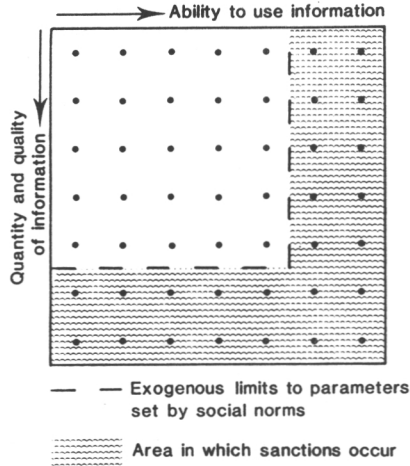


Figure 2.4 Exogenous limits to the behaviour matrix

Thus, in a dynamic society, e.g. a society with growth or spread effects, a general change in, say, technology, or any other innovation, may cause the entrepreneur to suffer a parametric shock after which he must adapt to the new situation or disappear from the landscape, figure 2.3. This is in fact the normal mechanism of industrial evolution, or what Batten (1981;1) calls "the notion of evolution in a self-organizing industrial systems".

However, in a static society, i.e. a society suffering from backwash effects, the entrepreneur may perceive an environmental potential which extends beyond the perceptions of his traditionally oriented society. As the entrepreneur in this environment acquires more knowledge and more ability to use that knowledge he will deviate from social norms and incur sanctions. The parameters of the behaviour matrix, figure 2.4, can therefore be seen to be truncated beyond the levels accepted by the social norms. The entrepreneur, responding to sanctions, or seeking to avoid them, must either maintain his activities at a level society accepts, i.e. he must lower his aspirations, or he must move to a new environment which is perceived to offer fewer restrictions to his entrepreneurial aspirations.

In section 2.6 an attempt has been made to demonstrate that the relationship between the environment and the individual entrepreneur is not, deterministic. Given a deterministic relationship, each entrepreneur would perceive a similar set of constraints, and the environmental potential would be the same for all. Instead, differently perceived states in the environment, based on each entrepreneur's life-space and values, will lead to as many perceived environments as there are entrepreneurs. Each entrepreneur will perceive different potentials in the same physical environment depending on the quality and quantity of his goals and aspirations, and to his degree of sensitivity to the norms set by his social environment. Further, the entrepreneur will react to changing environment parameters by increasing his contributions in order to maintain his level of satisfaction, or he may maintain his level of activity and lower his level of satisfaction. Falling levels of performance and satisfaction will not, recalling the argument of Lazarus (op cit) and Pred (op cit), necessarily result in "stress reaction". The negatively changing environmental parameters may simply cause the

entrepreneur to be satisfied with "making do", and to evoke dissonance behaviour to avoid disappointment.

2.7. Argument

At the beginning of this chapter, the discussion on philosophical considerations argued that a humanistic, rather than purely positivistic approach to the investigation of small-scale entrepreneurs in rural areas was appropriate. In particular, it was noted that the humanistic methodology included approaches such as imaginative self-transportation and interpretive understanding (verstehen). The approach to the investigation, and thus to the frame of reference, began from the position that it is necessary to present a view of the world as seen by the subject. Also, the humanistic approach denied the construction of an a priori model. The impossibility of a purely humanistic approach free of positivism, it was argued, would of necessity lead to an eclectic approach to the frame of reference.

The discussion in the above sections has made no attempt to avoid such eclecticism. The aim has been to provide a logical basis from which to attempt to apply humanistic arguments to the positive inclined empirical analysis which follows, in which physical and mental variables are awarded equal status.

In keeping with the spirit of the humanistic approach adopted, no attempt is made to construct an a priori model, nor to erect strict a priori hypotheses. The empirical analyses progress on the basis of intuitively guided arguments derived from the subject field and the frame of reference.

3. METHODS AND MATERIALS

3.1. Methodological limitations

The phenomenological orientation of the investigation creates a number of methodological problems. For example, Spiegelberg (1976;700) notes that "the phenomenological approach is opposed to exploratory hypotheses... it confines itself to the direct evidence of intuitive seeing..." Such an approach is clearly at odds with the positivistic scientific tradition. The phenomenological method of imaginative self-transposal requires the investigator to imagine himself in the place of the subject, and to attempt to perceive the world with his eyes. Spiegelberg (1975;51) argues that the subject, by putting his own perspective at the disposal of the investigator provides him (the investigator) with a unique extension of his operating base: "Now the analyst can really use the eyes of the subject...". This method is referred to a cooperative encounter and exploration (see Johnston 1983:59).

The concept of interpretive understanding (verstehen) requires a slightly different approach. According to Outhwaite (1975; in Johnston, op cit;61)

We "understand" people's states of mind (and make inferences about their motives and intentions) with the aid of: a) visible signs...; b) explicit statements...; c) a knowledge of the "facts of the situation" which leads us to expect one sort of attitude or intention rather than another...

Thus, we try to understand the "situation" in which the subject's emotions or intentions "make sense". It is argued by many writers that it is impossible for humanistic approaches to replace positivism completely (cf. Johnston

op cit; 74-86). It is also recognized that the humanistic approach is "methodologically obscure" (Entrikin 1976;616). It is also argued that the humanistic approach involves a way of thinking rather than being a practical activity. However, Ley and Samuels (1975;14, in Johnston op cit; 75) believe that

While humanistic methodology is eclectic and the sources for interpretation are numerous, ranging from archival research to participant observation, for the geographer the methods converge upon a group in place and the landscape they occupy.

Johnston (ibid.) concludes that the practical approach to humanistic research is largely a personal matter, involving intuition and imaginative interpretation. Thus, following Johnston (op cit; 54) while many of the humanistic philosophies propose that all knowledge is subjective, this knowledge is not random or chaotic, it is in fact ordered by individuals according to their own theoretical system.

3.2. Analytical methods

Socio-economic relationships are seldom, if ever, simple. When these relationships are considered in a humanistic framework, the situation becomes even more complex. Handling an empirical study based on a humanistic framework and in the absence of a priori hypotheses, leads to a number of methodological difficulties and dangers. It is at this point that the humanistic approach is at its most controversial, and it is also at this point that the humanistic approach cannot avoid adopting elements of positivism. Cases and variables have to be selected, and then treated in a meaningful way which permits the presentation of result in such a manner that the logic of the argument is readily accessible to the reader. A frame of reference, if not a theory or model, is a minimum requirement for the preparation of an empirical

investigation. The method of interpretative understanding is meaningless if the "understanding" resides only in the mind of the investigator.

This having been said, the lack of hypotheses does restrict the application of many statistical and econometric techniques. Indeed, many of these positive techniques are not philosophically compatible with the humanistic approach. Nevertheless, a strategy and method for examining the data matrix is essential. A data matrix consisting of $(n^2-2)/2$ correlations becomes a formidable object when the cases and variables are large in number. At best, searching such a matrix for relationships and patterns is blindly inductive (cf. Johnston 1978:127), and rapidly becomes impossible with increasing matrix size. A means is therefore required which will identify discrete groups of related variables. Factor analytical techniques are well suited for such a task.

The theory of factor and principal component analysis will not be discussed here. Suffice it to say that reference has been made to Kendall 1957; Harman 1960; Johnston 1978; van de Geer 1971. Certain risks which occur with the use, or rather mis-use, of factor analysis require discussion, however. The problem lies in the interpretational phase of the analysis.

Elffers (1980:318) distinguishes two phases in a successful factor analysis; the technical phase (i.e. the mathematical phase) and the interpretational phase. The latter is meant to give real meaning, with respect to the science under discussion, to the "mathematically possible" factors. It is in the interpretational phase that the main objections to factor analysis as a method in causal analysis arise (cf. Valkonen 1971:110-21). Hahtola (1971) and Johnston (1978) both regard factor analysis as only a means of interpreting the correlation matrix. The interpretation of a single correlation is therefore, according to Hahtola

(1971)

equally subjective in factor analysis as in any other correlative method. The factor analysis does not offer any additional liberties to the imagination.

Hahtola also argues that the unavailability of testing methods in factor analysis is at least partly offset by the ability to handle a large number of variables simultaneously.

The main problem with factor analysis, however, would appear to lay in its misapplication rather than in the method itself. Valkonen (1971;116), for example, claims that all too often researchers do not fully understand why they have employed factor analysis. In such cases, the method offers an easy solution where the problem is weakly specified. Consequently, the factors obtained may well describe non-existent phenomena, or at least they may be very unclear. This is particularly so where factor analysis is employed in causal analysis to gain a general view of the variable matrix. This use of factor analysis has been criticized by Hirschi and Selvin (1967, see Valkonen op cit; 116) as it can also lead to vague results.

Hahtola (1971;275) argues that too often researchers are obliged to rely on numerous and contradictory recommendations concerning the use of factor analysis, and they therefore fail to apply the method to their special methodological setting. Järveläinen (1971;290) also criticizes the misuse of factor analysis, arguing that the the study problem should be stated sufficiently clearly in order that the suitability of the factor model to the problem can be evaluated. Elffer (1980;318) stresses that the interpretational phase of factor analysis requires the presence of a theory strong enough to be able to determine whether a proposed interpretation is tenable or not.

Bearing in mind the above warnings concerning the use of factor analysis, every effort has been made to build stable models (using principal components) which bear clear and unambiguous relationships to the frame of reference (in a positivistic sense) but which offer interpretations which fulfill the humanistic requirements. The structure of the empirical investigation permits the building of a number of factor models which are interrelated both structurally and interpretationally. The result is a set of complementary factor models which permit the checking of interpretational consistency.

3.3. On the appropriate spatial level

The problem of the appropriate spatial level for socio-economic analyses has not received a great deal of attention, cf. Selby (1981b). It is clear that the level from which an analysis proceeds is determined by the problem to be solved. However, in socio-economic research a problem may manifest itself at all spatial levels, the difficulty then becomes to determine whether the problem is being transmitted downwards through the system or upwards, or at which level solutions to the problem may best be applied. A contribution to the discussion of appropriate levels of problem solving which is particularly relevant to the present investigation comes from Eskelinen (1983), who presents evidence that suggests that the village level is the most appropriate level for solving socio-economic problems. This view is based on the fact that because of the small size of villages, it is there that the failures of social and economic policies are most readily felt. It is also at the village level that remedies can most effectively be applied.

3.4 Material

The material for the empirical part of the investigation was collected by interviews in 1982 from 64 small sawmills found

to be operating in North Karelia. Of these 64 sawmills three were found to have capacities too large for inclusion in the investigation and were rejected. A fourth also exceeded the 5000 m³/year limit, but was retained in the investigation because the greater part of its production was sold for domestic consumption, and not for export. Over twenty of the small sawmills identified from the records of the provincial authorities and the communal commercial records were found to have ceased production during the previous decade. No attempt to study these deceased mills has been attempted at this time, but they remain an interesting subject for future investigation. It also has to be recognized that the contract sawmill is not necessarily a permanent feature of the landscape. The presence of a tractor or other auxiliary power on a farm is sufficient basis for the operation of a small portable sawmill, see Huttunen 1981. While the present investigation has made great efforts to include all the known small sawmills in North Karelia in the investigation, the ephemeral nature of portable small sawmill operation, and the inadequate local records of small sawmill activities result in the inevitable probability that some small sawmills have not been investigated. However, it is felt that few of the more permanent small sawmills have been missed.

The sawmills in the investigation fall into three groups; i) the contract sawmills, which sell only their services and do not sell sawn timber commercially; ii) the contract-commercial sawmills, which sell both their services and sawn timber; and iii) the commercial sawmills, which only sell sawn timber and do not sell their services. This a priori classification provides a useful basis for examining the structure of the industry in question and for examining the behaviours and attitudes of the entrepreneurs operating in these groups.

From the interview material, 180 variables were constructed.

These variables concerned location, firm structure, supply of raw material, production and distribution of sawn timber, consumption of sawn timber, competition and marketing, the degree of satisfaction of the entrepreneur and his basic attitudes and values in business, and his perceived environment. Only a few of these variables are used in the present study. The remainder form the basis of the on-going investigation.

Of the 180 variables available, 28 are used in the present study. The variables have been selected to operationalize, as closely as possible, the humanistic elements of the frame of reference. It is important to recall at this juncture that the philosophical consideration involved in the investigation permit, indeed require that both mental and physical attributes receive equal status in the empirical analysis.

Variable x_1 describes the sawmill type on the basis of the a priori classification described above. Variables x_2 to x_{13} are mental variables which concern the entrepreneurs' attitudes and values. These variables were constructed and first employed successfully by Hahtola (1973):

- x_2 It is better to live poorly on one's own resources than to contract debts
- x_3 Money only has value if it is acquired by hard work
- x_4 A moderate but safe living is more valuable than a position with a high salary
- x_5 Many a time in life it is worth taking risks
- x_6 It is natural that the weaklings perish
- x_7 Nowadays it is worth trying to improve one's standard of living
- x_8 It is a shame if one cannot depend upon one's own resources
- x_9 Regretably one has to "elbow" if one is going to succeed in life
- x_{10} It is a mistake to chose a profession on the basis

- of monetary income
- x_{11} It is better for one to trust life's experience than, for example, to believe in the views of scientists, which are always changing
 - x_{12} Living in a town is much easier and much more comfortable than living in the country
 - x_{13} It is good that society changes, because the changes are usually for the better
 - x_{14} Landowning is the safest guarantee of security and independence

Variables x_{15} to x_{22} measure the environment as perceived by the entrepreneur. As such, these variables fall between purely physical and purely mental variables in that they concern the physical business environment, but as seen through the eyes of the entrepreneur.

- x_{15} Perceived raw material supply
- x_{16} Perceived transportation
- x_{17} Perceived access to markets
- x_{18} Perceived services
- x_{19} Perceived business environment
- x_{20} Perceived taxation
- x_{21} Perceived power supply
- x_{22} Perceived labour supply

The following variables represent three types of activities. The first activity area concern information gathering (x_{23} and x_{24}); the second concerns marketing (x_{25}); and the third concerns actual production (x_{26} and x_{27}):

- x_{23} Information gathering (dichotomous)
- x_{24} The number of professional affiliations
- x_{25} Marketing area
- x_{26} Annual production of sawn timber (1982)
- x_{27} Proportion of sawn timber used for own further manufacturing

The final two variables employed in the present study are x_{28} (location in commune) and x_{29} (degree of business satisfaction).

4. ATTITUDES AND ACTIVITIES

4.1. Basic factor model - all small sawmills

The attitudes and activity model for all the sawmills in the investigation was constructed by principal components analysis using 14 attitudinal variables describing the entrepreneurs' attitudes to business activities, and five variables describing the production, marketing and location of the sawmills. It was hoped that a model based on these variables would provide factors that would relate activities and attitudes in a way that would make sense. The criteria for interpreting the factors being the intuitively guided arguments embodied in interpretive understanding, which in turn are derived from the frame of reference. The model was constructed step-wise, starting with the attitude variables and then adding the activity variables one by one in order to control the stability of the model. The three-factor varimax model presented in table 4.1 is not considered to be optimal. There appears to be no reason why the model should not be developed further, but for the purpose in hand the model is operationally adequate. The factors are described and interpreted as follows:

B1: Energetic competitiveness

B2: Aggressive independence

B3: Maturity

Factor B1: Energetic competitiveness

The variable with the highest loading of factor B1 concerns location (x_{28}), so that as the factor strengthens the location of the enterprise is closer to the commune centre, and as the factor weakens the enterprise is located more and more towards areas of scattered settlements. From the point of view of markets, services and communications a location near the commune administrative centre can be regarded as the more favourable location alternative. Variable x_{27}

Table 4.1. Basic principal components model for all sawmills in the investigation

x	B1	B2	B3	h_3^2
28	0.59			0.43
27	0.54			0.30
25	0.51			0.41
6		0.67		0.47
8		0.64		0.43
29		-0.56		0.37
14		0.56		0.43
9		0.55		0.39
11			0.70	0.57
3			0.60	0.40
7			0.53	0.29
5	0.47			0.23
10	-0.41			0.25
2	-0.48			0.40
12				0.24
13	-0.46			0.33
4				0.22
26				0.14
VP	2.31	2.06	2.02	

In the above factor loading matrix, loadings less than 0.40 have been omitted. VP is the variance explained by the factor.

indicates the intensity of the sawmills' further wood-processing activities, and therefore the diversity of the mill. Diversification, together with marketing range (x_{25}) increase as factor B1 strengthens, as does the willingness to take risks (x_5). The factor therefore

represents, on the basis of the positively loaded variables, energetic business activities coupled with a (more) rational location. The factor interpretation is strengthened by the negative loadings of variables x_2 and x_{10} . Thus, as the factor strengthens the entrepreneurs are increasingly in disagreement with the sentiment that it is better to live poorly than to risk debts (x_2), and similarly, they are increasingly in disagreement with the sentiment that a profession chosen for money is a mistake (x_{10}).

Table 4.2. Distribution of B1 factor scores by sawmill type

Score*	contract sawmills		contract-commercial sawmills		commercial sawmills	
	no	%	no	%	no	%
Very low	2	6	0	0	1	8
Low	16	46	2	14	0	0
Average	14	40	8	57	2	17
High	3	9	2	14	6	50
Very high	0	0	2	14	3	25
Total	35	100	14	100	12	100

Pearson Chisquare 27.75 d.f.8 Prob. 0.00

*Very low = -1.50 and under
 Low = - 0.50 to -1.49
 Average = +0.49 to -0.49
 High = +0.50 to +1.49
 Very high = +1.50 and over

The distribution of the factor scores for factor B1 by mill types is shown in table 4.2. As can be expected, the

commercial mills, with one exception, receive high scores. This result is logically consistent with the interpretation of the factor.

Consistent with the interpretation of the factor, the contract-commercial mills are not so highly scored, while the majority of the contract sawmills receive low positive, or negatives scores.

Factor B2: aggressive independence

Factor B2 has as its strongest variables x_6 (If is natural that the weaklings perish) and x_8 (If is a shame if one cannot depend on one's own resources), and negatively loaded, x_{29} (Degree of satisfaction). The two strong positive loadings, together with the less strongly loaded variable x_9 (Regretably, one has to "elbow"...), indicate a very aggressive attitude to life, whereas x_8 and the weaker x_{14} (Land owning...) both suggest a need for independence and security. The variable describing the entrepreneur's degree of business satisfaction (x_{29}) is negatively loaded onto factor B2, indicating that as satisfaction decreases, aggressive attitudes strengthen. The alternative interpretation is that the aggressive entrepreneur is never satisfied.

The scores for factor B2 are tabulated against sawmill type in table 4.3. As with factor B1, a larger proportion of the commercial sawmills receive high positive scores compared with the other sawmill types. None-the-less, a high proportion of the contract-commercial mills also receive positive scores. The majority of the contract mills, on the other hand, receive scores around the mean, or negative scores. Only 30 % receive scores above the mean.

Factor B3: Maturity

The third basic factor reflects a more stable and mature outlook on life on the part of the entrepreneur. The

Table 4.3. Distribution of B2 factor scores by sawmill type

Score*	Contract		Contract-commercial		Commercial	
	No	%	No	%	No	%
Very low	1	3	1	7	2	17
Low	8	23	5	36	1	8
Average	15	43	3	21	4	33
High	9	26	5	36	3	25
Very high	2	6	0	0	2	17
Total	35	100	14	100	12	100

Pearson Chisquare 9.25 d.f.8 Prob. 0.32

* See note to table 4.2.

variables with the strongest loadings on factor B3 concern dependence on past experience (x_{11}), a conservative attitude to monetary value (x_3) - possibly reflecting a strong work ethic, coupled with a positive attitude to life (x_7). The factor lacks the aggressive attitudes and lack of satisfaction that characterized factor B2, which by comparison seems to reflect a somewhat immature attitude to life.

Factor B3 scores are tabulated against sawmill type in table 4.4. Commercial mills receive low scores here, while the proportion of contract, and contract-commercial mills with high positive scores are 31 % and 33 % respectively.

The more relaxed attitudes found in factor B3 equate with the (presumably) less competitive commercial mills, and with the diversified economy of the contract-commercial mills, which in general are smaller than the commercial mills (see

Table 4.4. Distribution of B3 factor scores
by sawmill type

Score*	Contract		Contract- commercial		Commercial	
	No	%	No	%	No	%
Very low	1	3	1	7	3	25
Low	6	17	2	14	3	25
Average	17	48	7	50	3	25
High	9	26	3	21	3	25
Very high	2	6	1	7	0	0
Total	35	100	14	100	12	100

* See note to table 4.2.

Pearson Chisquare 7.92 d.f.8 Prob. 0.44

table 1.2), and contract mills, which are mostly part-time operators (table 1.4).

4.2. Factor models by sawmill types

4.2.1. Justification

The basic factor model discussed above concerned the 61 small sawmills in North Karelia. The model proved to be stable, i.e. adding additional variables did not cause the structure of interpretation of the factors to change in an unpredicted manner. However, the basic factor model contains sawmills of three distinct types, which do not have uniform backgrounds. There is, therefore, some justification for attempting to run the factor model by sawmill types, despite the acknowledged risk of conducting multi-variate analysis with very few cases. The aims of re-calculating the basic model individually for the sawmill groups are two-fold: i) to test the stability of the basic

model, and ii) to see how the factor models vary between the groups. The risk of using a small number of observations is only justifiable because the models will be theoretically and structurally directly linked to the basic model. Only if the sub-models behave logically with respect to the larger model, and with respect to each other, can their acceptance into the analysis be defensible. In the event, the risk has been justified. The sub-models contribute to a deeper understanding of the attitudes and activities of small-scale entrepreneurs.

4.2.2. The commercial sawmill model

The commercial sawmill model is a three factor principal components model with varimax rotation, table 4.5. The factors account for 56 % of the total variance, and the three factors can be described as follows:

Cm1: Conservative independence

Cm2: Expansiveness

Cm3: Security

Factor Cm1: Conservative independence

Factor Cm1 is characterized by high loadings of variables x_{11} (It is better to trust life's experiences...) x_8 (It is a shame if one cannot depend on one's resources) and x_6 (It is natural that the weaklings perish). Thus, as the factor strengthens, trust in life's experience increases, belief in self-reliance increases, and belief that the weaklings should perish increases. The "independence" interpretation is supported by the positive loading of x_{14} (land owning is the safest form of security). The "conservative" interpretation is supported by the negative of x_{13} , i.e. as the factor strengthens, support decreases for the belief that society always changes for the better.

Both aspects of the interpretation are supported by the

Table 4.5. Principal components model for the commercial sawmills

x	Cm1	Cm2	Cm3	h_3^2
11	0.86			0.78
13	-0.75			0.69
8	0.73			0.57
6	0.68			0.60
29	-0.63			0.42
14	-0.61	0.55		0.68
3	0.51			0.35
25	0.87			0.80
5		0.85		0.75
28		0.73		0.53
2		-0.66		0.46
4			0.85	0.73
27			-0.68	0.54
26			0.57	0.55
12			0.57	0.33
7			-0.41	0.26
9	0.41		-0.48	0.50
VP	3.81	3.44	2.59	

N.B. See footnote to table 4.1

albeit fairly weak loading of x_3 (Money only has value...) on the factor. The positive loading of x_6 (It is natural that the weaklings perish) and the negative loading of x_{13} (It is good that society changes...) combine to create a somewhat bitter tone in the factor. This interpretation is supported by the negative loading of x_{29} (degree of business satisfaction) on the factor.

The positive loadings of x_{11} and x_3 on factor Cm1 gives the factor structural and interpretational links with the

basic factor B3 (maturity). However, the loading of x_7 (Nowadays is its worth trying...) on B3 gives that factor a "positive" or "optimistic" tone, whereas the tone of factor Cm1 is decidedly "negative" with the presence aggressive attitudes (x_6), conservatism (x_{13}) and dissatisfaction (x_{29}).

Factor Cm2: Expansiveness

The variables with the strongest loadings on factor Cm2 are x_{25} (marketing range), x_5 (Many a time in life it is month taking risks) and x_{28} (location). These variables suggest a combination of expansiveness and locational rationality. Thus, as the factor strengthens, the marketing range increases, The attitude to risk taking become increasingly affirmative and the location becomes more central. The negative loading of x_2 (It is better to live poorly...) supports the interpretation as it has a complementary interpretational affiliation to the positively loaded x_5 (Many a time in life it is worth taking risks). The strong positive loading of variables x_{25} , x_5 and x_{28} , together with the strong negative loading of x_2 give factor Cm2 a structural and interpretational affinity to factor B1 (Energetic competitiveness) in the basic model.

Factor Cm3: Security

The security interpretation is given to factor Cm3 for the following reasons. As the factor strengthens there is a greater agreement that a moderate but safe living is a preferable life style to taking risks (x_2) and that life in towns is easier than life in the country (x_{12}). Somewhat oddly, x_{26} (sawn timber production) is positive loaded on this factor. Also, the variable describing the proportion of sawn timber used for own further manufacturing (x_{21}) is negatively loaded on the factor. Thus, as the factor strengthens the production of sawn timber increases but the use of sawn timber for manufacturing decreases. The explanation of this result, which is at odds with the same variables' loadings on basic factor B1, in fact supports

the interpretation of factor Cm3. The desire for security, i.e. risk minimization, results in a preference for a single production line, rather than risk-taking diversification. Following the arguments presented in section 2.4 of the frame of reference, the entrepreneur here opts not to increase his contributions to the enterprise which would be required to diversify and so increase his inducements. This implies that satisfaction has been reached by the level of sawn production achieved by the mills represented by this factor. If the implication is valid, it can be expected that sawmills with positive factor scores for factor Cm3 will possess a higher mean production of sawntimber than the sawmills with negative scores. In the event, eight mills possessed positive scores, and four possessed negative scores. The mean sawmill production for the positive group was 3051 m³ in 1981, while the negative group's mean was 1464 m³. Testing the significance of the difference of the means using the t-distribution gave a result of 2.41 which is significant at 5 % risk.

Factor Cm3 is not structurally or interpretationally related to any of the basic factors.

4.2.3. The contract-commercial sawmill model

Again, a sensible working model was provided by a 3-factor principal components solution with varimax rotation, table 4.6. The tree factors accounted for 54 % of the total variance. The factors are:

- CC1: Maturity
- CC2: Aggressive diversity
- CC3: Expansive independence

Factor CC1: Maturity

This factor is characterized by the positive loadings of x_{11} , x_5 and x_7 . Thus, as the factor strengthens, trust in life's experience (x_{11}) increases, willingness to take risks (x_5) increases, and the entrepreneur has an

Table 4.6. Principal components model for the contract-commercial sawmills.

	CC1	CC2	CC3	h_3^2
x				
12	-0.73			0.60
11	0.73			0.65
5	0.70			0.52
7	0.70			0.56
9	-0.54			0.30
10		-0.87		0.80
28		0.80		0.69
27		0.66		0.53
6		0.54	0.46	0.51
29	0.47	-0.51		0.52
14			0.83	0.72
13			0.74	0.66
8			0.68	0.56
2			-0.53	0.33
26		-0.41		0.27
3				0.25
4	0.47			0.23
25			0.46	0.33
VP	3.33	2.95	2.82	

See note to table 4.1.

increasingly positive attitude towards trying (x_7). The maturity interpretation gains strength from the negatively loaded variables on factor CC1. Now, as the factor strengthens agreement with the sentiment that "elbowing" is necessary (x_9) decreases, and disagreement with the sentiment that life in towns is easier (x_{12}) increases. Both negatively loaded variables therefore indicate a sense of well-being with the present situation. Factor CC1 is

therefore similar in interpretation to the basic factor B3 (Maturity), and can be said to be opposite in "spirit" to factor Cml (Conservative independence) in the commercial sawmill model. Compared with the latter, the present factor lacks the somewhat "bitter" tone found in Cml. The more optimistic interpretation of factor CC1 is supported by the positive loading, albeit weakly, of x_{29} (degree of business satisfaction) on this factor.

Factor CC2: Competitive diversity

Factor CC2 is formed by the high positive loadings of x_{28} and x_{27} together with the high negative loadings of x_{10} . The "competitive" interpretation is based on the fact that as the factor strengthens, the location of the enterprise becomes more central (x_{28}) and disagreement with the opinion that "a profession chosen solely for money is a mistake" (x_{10}) increases and similarly, agreement with the opinion that "it is natural that the weaklings perish" increases (x_6). The "diversity" element of the interpretation is provided by x_{27} (proportion of sawn timber production used in own manufacturing) which is fairly strongly and positively loaded on the factor. As in the case of the commercial mills, however, variable x_{27} is negatively correlated with the quantity of sawn timber produced (x_{26}). Variable x_{26} is very weakly and negatively loaded on factor CC2. The variable describing the degree of business satisfaction (x_{29}) is also fairly weakly and negatively loaded on to the factor. This follows the basic factor B2 (Aggressive independence) and the commercial sawmill factor Cml (Conservative independence) in that as aggressive attitudes increase, the degree of satisfaction decreases. However, structurally and interpretationally, factor CC2 is most similar to basic factor B1 (Energetic competitiveness).

Factor CC3: Expansive independence

The third factor of the contract-commercial sawmill entrepreneurs consists of the high positive loadings of

x_{14} representing a practical attitude to financial security, x_{13} representing a liberal attitude to society and social change, and x_8 representing financial independence. Two of the variables therefore support the "independence" interpretation. The "expansive" interpretation is justified by the strong loading of x_{13} on the factor, as well as the weak, but positive loading of x_{25} (marketing area). The factor contains, however, an element of aggressive competitiveness (x_6 -It is natural that weaklings perish)) which must be born in mind when interpreting variable x_{13} (It is good that society changes).

4.2.4. The contract sawmills models

The variables entered into the principal components analysis for the contract sawmills are the same as for the commercial and contract-commercial sawmills, with the exception of x_{27} (proportion of sawn timber used for own further manufacturing). This variable does not concern the contract mills which only sell their services. It is also to be noted that 83 % of the contract sawmills are affiliated to agricultural enterprises (table 1.3), and further, all are part-time.

The three-factor varimax model is shown in table 4.7. The model accounts for 38 % on the total variance. The factors are described as follows:

Cn1: Conservative independence

Cn2: Aversion to risk

Cn3: Liberal producer

Factor Cn1: Conservative independence

Factor Cn1 has structural and interpretational affinities with the basic factor B2 (Aggressive independence) and the commercial sawmills factor Cn1 (Conservative independence).

Table 4.7 Principal components model for the contract sawmills

x	Cn1	Cn2	Cn3	h_3^2
14	0.82			0.70
6	0.70			0.52
8	0.64			0.45
2		0.63		0.50
12		0.60		0.39
4		0.60		0.38
5		-0.55		0.38
13			0.64	0.49
3			-0.57	0.50
26			0.51	0.28
25	-0.46		0.46	0.53
9			0.46	0.24
10				0.12
11				0.18
29				0.23
7	0.43			0.34
28		-0.46		0.31
VP	2.44	2.31	1.87	

See note to table 4.1.

As in both the previous factors, land owning (x_{14}) considered to be the best form of security, it is considered natural that the weaklings perish (x_6), and it is regarded as a shame if one cannot rely on one's own resources (x_8). Factor Cn1 therefore indicates that high values are placed on security and financial independence, together with the somewhat aggressive intolerance and lack of empathy represented by x_6 . Marketing area (x_{25}) is negatively loaded onto factor Cn1, indicating a restricted activity area consistent with the mill type in question. The "conservatism" in the interpretation is implied by the

positive loading of x_6 indicating lack of empathy together with the lack of wider social contacts implied by the narrow marketing activity (x_{25}). These implications are derived from the conservative nature of traditional, or Gemeinschaft type societies, described in section 25, which are in part characterized by narrow social contacts and a lack of empathy. However, the factor is given a somewhat optimistic "tone" by the presence, albeit weakly, of x_7 (Nowadays it is worth trying).

Factor Cn2: Aversion to risk

Factor Cn2 for the contract sawmills possesses structural affinities to basic factor B1 (Energetic competitiveness), as well as to factor Cm3 (Security, CC1 (Maturity) and CC2 (Aggressive diversity). Interpretationally, however, this affinity is less well marked; the closest being factor B1 (Energetic competitiveness) with all signs reversed. The interpretation of Cn2 is straightforward, and centres on the strong positive loadings of variables x_2 (It is better to live poorly...), and the strong negative loading of x_5 (Many time in life it is worth taking risks). The three variables each refer to risk-taking and loans. Further, the strong positive loading of x_{12} , i.e. strong support for the view that life in towns is easier than life in the country, supports the aversion to risk interpretation if the urban environment is considered from the view point of the rural entrepreneur who perceives towns as offering wealth and ease of services. The negative loading of x_{28} (location) on the factor means that as the factor strengthens the location of the sawmills is increasingly rural, i.e. in scattered settlements. This result supports the above interpretation of variable x_{12} .

Factor Cn3: Productive liberal

The "liberal" interpretation stems from the positive loading of x_{13} (It is good that society changes...) and the negative loading of x_9 (Regretably, one has to elbow...) on the factor. Thus, as the factor strengthens, the liberal

attitude represented by x_{13} gains greater approval while the aggressive competitiveness represented by x_9 is increasingly disputed. Sawn timber production (x_{26}) and activity area (X_{25}) are both loaded positively on factor Cn3. Accordingly, the strengthening of liberal attitudes is associated with increased sawn timber production and a widening activity area (i.e. more professional contacts). Interpretationally, therefore, the factor tends to be the opposite of factor Cn1, above, in which restricted horizons and lack of empathy lead to conservatism and intolerance. Structurally, factor Cn3 does not have links with the other factor models described above.

4.3. The comparability of the factor models

The aim of presenting factor models for each group of sawmills, in addition to all the small sawmills together, was i) to test the stability of the basic factor model, and ii) to see how the factor models vary between the groups. It has been shown by the above procedure that the structural and interpretational integrity of the basic model has held up well throughout the sub-groups. As in the basic model, the factors in the sub-models tend to follow a continuum from energetic competitiveness to mature satisfaction. The sub-models have the effect of bringing out nuances which are not apparent in the basic model. These nuances concern the extra stress laid on security (Cm3) and aversion to risk (Cn2); conservative independence (with somewhat negative inferences) as in Cm1 and Cn2; independence (with positive inferences) is found in CC3; while expansiveness or aggressive competitiveness is found in Cm2 and CC2. The most "liberal" of the factors is Cn3.

A characteristic of factor and principal components analysis is that the largest proportion of the total variance is explained by the first factor. The first factor is, so to speak, the strongest. It therefore follows that the first factor in each model reveals the most important

characteristics of the variable matrix in question. In the present analysis, therefore, it is instructive to examine the first factors of the four factor analyses presented above. These four factors are as follows:

B1: Energetic competitiveness

- + x₂₈ Location in commune
- + x₂₇ Proportion of sawn timber used in own further manufacturing
- + x₂₅ Marketing area
- x₂ It is better to live poorly...
- x₁₀ A profession chosen only for money is a mistake

Cm1: Conservative independence

- + x₁₁ It is better to trust life's experiences...
- + x₈ It is a shame if one cannot live on one's own resources
- + x₆ It is natural that the weaklings perish
- + x₃ Money only has value if it is earned by hard work
- x₂₉ Degree of business satisfaction

CC1: Maturity

- + x₁₁ It is better to trust life's experiences...
- + x₅ Many times in life it is worth taking risks
- + x₇ Nowadays it is worth trying
- x₁₂ Life in towns is easier than life in the country
- x₉ Regretably, one has to "elbow"...

Cn1: Conservative independence

- + x₁₄ Landowning is the safest form of security
- + x₆ It is natural that the weaklings perish
- + x₈ It is a shame if one cannot live on one's own resources
- + x₇ Nowadays it is worth trying
- x₂₅ Marketing area

According to the first basic factor (B1) the small sawmills

of North Karelia possess a strong tendency to be energetically competitive, i.e. to be located at or near the commune centre, to use their own sawn timber for further manufacturing and to actively market their products over a fairly wide area. The presence of x_{27} indicates that the factor is being influenced by the commercial and contract-commercial sawmills because the purely contract mills, by definition, do not contribute to the variable.

When taking the different sawmill classes into account, other characteristics become evident. Thus, in the commercial sawmills model, the principal factor (Cm1) is interpreted as "conservative independence". The factor has not structural or interpretational links with factor B1. The first factor of the contract-commercial sawmills (CC1) is interpreted as "maturity". Factor CC1 is structurally related to factor Cm1, but in "tone" is interpretationally very different. Finally, in the contract sawmills model, factor Cn1 is both structurally and interpretationally related to Cm1 - both factors being interpreted as "conservative independence". Given the differences in the structure and affiliation between the contract sawmills, which are largely supplementary to agriculture and are also often part-time in operation, and the larger independent commercial mills, the similarities between factors Cm1 and Cn1 need to be considered. The key structural links between the factors Cm1 and Cn1 are variables x_6 (It is natural that the weaklings perish) and x_8 (It is a shame if one cannot live on one's own resources, the former reflecting a more primitive sense of competition, the latter reflecting independence. In Cm1, additional variables are x_{11} (It is better to trust life's experiences...) and x_3 (Money only has value...), both positively loaded, and x_{29} (Degree of satisfaction) negatively loaded. In the context of Cm1, x_{11} can be interpreted "negatively", i.e. with the emphasis on mistrust of information, while x_3 reflects a conservative, or traditional, attitude to money. The negative loading of x_{29} reinforces the "negative" tone of

the positively loaded variables. On the other hand, the additional variables loaded onto Cn1 are x_{14} (Land owning is the safest form of security) and x_{25} (Marketing area). The positive loading of x_{14} , the highest loading on the factor, strongly reflects the agricultural origins of the entrepreneurs, in that land ownership is regarded as the safest form of security. The negative loading of x_{25} reflects the supplementary nature of the contract sawmills in that the marketing area remains small.

Factor CCl for the contract-commercial sawmills contrasts with the two factors just discussed. The main difference is in the "tone" of the interpretation because, as with Cml, factor CCl possesses x_{11} (It is better to trust life's experiences...) as the variable with the strongest loading. However, whereas in factor Cml variable x_{11} was considered to possess "negative" connotations, in CCl the variable is interpreted "positively". This change in emphasis is justified when reference is made to the other variables loaded on to factor CCl. Strongly positively loaded with x_{11} is x_5 , which supports risk-taking. This positive attitude to risk taking has, however, to be interpreted in conjunction with the strong negative loading of x_9 , i.e. with the rejection of the need for "elbowing". Sympathy, and by inference satisfaction with life in the country, is demonstrated by the strong negative loading of x_{12} (Life in towns...). It therefore appears from the first factors of the above models that the diversity of the contract-commercial sawmills, of which all but one are independent firms, offers the entrepreneur greater freedom of action, and freedom from the negative aspects of risk taking and competition which appears to disturb the commercial sawmill operators.

4.4. Testing the factor model

4.4.1. Discriminant analysis as a test for factor analysis

The basic factor model has been demonstrated to be stable and interpretationally satisfactory. The group-wise factor models supported the interpretation of the basic factor model while adding further analytical insights concerning the behaviour and attitudes of the small-scale entrepreneurs in question. As pointed out in section 32, factor analysis is not without its problems, one of which is the danger that the "mathematically possible" factors cannot be given meaningful interpretations with respect to the science in question. In the present case, it can be confidently argued that the factors are meaningful. A further problem with factor analysis is the unavailability of testing methods, in the econometric sense. While the interpretational validity of the factors may be tested using cross-tabulation techniques, ANOVA or other grouping analyses where possible, it has to be conceded that such testing methods do not indicate the statistical validity of the interpretation, although they may indicate that the interpretation holds with respect to the frame of reference. Where the cases can be arranged into a priori groups, discriminant analysis offers a course of action which relies on a conventional statistical device, the F-ratio. On the basis of the F-statistic, discriminant analysis determines how well a set of variables discriminate, with the minimum of error, a set of classes, cf. Kendall 1957. Scores computed from the factors to be tested offer a set of variables for these further analyses.

The discriminant analysis proceeds on the basis of variables which exceed a predetermined F-value. This classification function can be interpreted rather as in factor analysis, but the function is stated with specific probabilities. The Mahalanobis D^2 statistic is calculated from the groups together with the a posteriori probabilities of case classification. The computation of eigenvalues and canonical correlations lead to the construction of the discriminant function. These additional stages each offer possibilities to test the validity of the original

interpretation.

4.4.2. A priori expectations

Scores computed for the basic factor model, which included all three entrepreneurial groups in question, are now subjected to discriminant analysis. To facilitate the testing role of the analysis, certain a priori expectations should be stated. Referring to the basic factors (B1-3), a continuum is observed, ranging from the energetically competitive entrepreneurs (B1) to the mature confidence, but relative uncompetitiveness, represented by factor B3. On the assumption that the commercial sawmill entrepreneurs, by definition, possess a more competitive spirit than the contract or contract-commercial sawmill entrepreneurs, then it can be expected that factor B1 scores will form a strong and positive classification coefficient in the analysis with respect to the commercial mills and a weaker positive coefficient with respect to be contract-commercial sawmills. Given the structure of factor B1, the contract sawmills cannot receive other than a negative coefficient. Factor B2 is less easy to specify. The aggressiveness and independence of spirit it attributes of entrepreneurs can be considered to cut across all groups. The factor should therefore be a poor discriminator. Factor B3 (maturity) reflects a more confident attitude than B2. It also contains aspects of traditional conservatism. These attributes do not suit the image of the energetically competitive commercial mill entrepreneurs, and so the factor can be expected to receive a negative classification coefficient with respect to the commercial sawmill group. On the basis of the group-wise factor model for the contract-commercial sawmills group, which revealed "positive" attitudes to life, the basic factor B3 can be expected to possess a positive classification coefficient with respect to the contract-commercial sawmill group. The traditional conservatism which is also revealed by factor B3, and which is supported by the group-wise factor model

for the contract sawmill entrepreneurs, can be considered to be a probable attribute of farmers, who dominate the ownership structure of the contract sawmills. On this basis, a positive classification coefficient can be expected in the discriminant analysis.

4.4.3. The discriminant function: a behavioural continuum

The factor scores of factors B1-3 were entered stepwise into the discriminant analysis. The F-to-enter value was set a 2.00, and the variables obtained the following F-to-enter values (d.f. 2,58): B1 9.87, B2 0.23 and B3 2.96. Factor B2 was therefore rejected from the analysis.

Table 4.8 Discriminant classification functions for the basic factor model.

Variable	Contract mills	Contract-commercial mills	Commercial mills
Factor B1	-0.56	0.39	1.18
Factor B3	0.24	0.02	-0.72
Constant	-1.23	-1.15	-1.78

Approx. F-statistics: B1 F=9.87 (d.f.2,58)
B3 F=6.16 (d.f.4,114)

This rejection confirms the expectation that the factor's broad applicability would make it unsuitable as a discriminator. The discriminant analysis therefore proceeded on the basis of factors B1 (energetic competitiveness) and B3 (maturity). These two factors can be considered to form two ends of a behavioural continuum, as described above. The classification functions are shown in table 4.8. The signs of the classification coefficients

are as predicted with respect to both the commercial and the contract sawmill groups. The latter receives a fairly strong negative coefficient from factor B1 and a moderate positive coefficient from B3. The commercial sawmill group on the other hand receives a very strong positive coefficient from B1 and a strong negative coefficient from B3. The contract-commercial sawmill group receives positive coefficients from both factors, strong in the case of B1, weak in the case of B3. This result suggests that the contract-commercial sawmill entrepreneurs tend in their behaviours towards the competitiveness shown by the commercial sawmill entrepreneurs rather than towards the behaviour attributes more typical

Table 4.9. Discriminant classification matrix of the basic factor model

Group	Percent correct	Number of cases classified into group:		
		Contract	Contract-commercial	Commercial
contract	68.6	24	4	7
contract-commercial	50.0	4	7	3
commercial	66.7	2	2	8
Total	63.9	30	13	18

of the contract sawmill owners. Such an interpretation is consistent with the affiliation structure of the contract-commercial sawmills, which are largely independent units, as are the commercial sawmills. However, this interpretation is not supported by the classification matrix derived from the classification functions discussed above.

Table 4.9 shows that only 50 % of the contract-commercial sawmill entrepreneurs are correctly classified by the behaviour continuum expressed by the classification functions. The remaining mills are shared, between the contract sawmill group and the commercial sawmill group with a greater tendency to be assigned to the contract mill group. The classification coefficients are presented diagrammatically in figure 4.1.

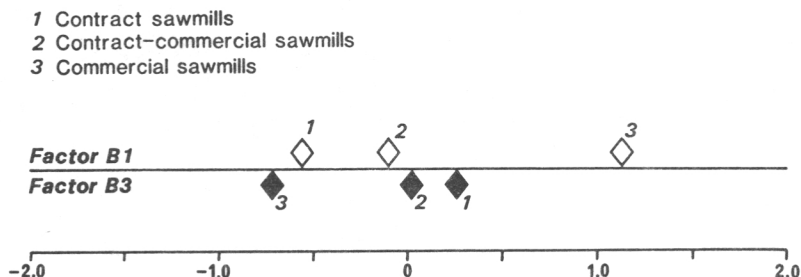


Figure 4.1. Classification coefficients for the sawmill entrepreneurs groups according to the discriminant analysis

The stronger discriminating power of factor B1 is clearly evident. This occurs for two reasons: 1) factor B1 discriminates the commercial and the contract mills by the nature of its structure - i.e. the variables it contains; ii) the first factor in a principal components solution always contains the largest proportion of the variance explained in the model. Following this reasoning, factor B3, with a smaller proportion of the variance (11.4 % against 12.8 % in a model in which 35 % of the total variance is explained), can be expected to have a weaker discriminating power, and this is also seen in figure 4.1. Factor B3 can be seen to discriminate the commercial sawmill entrepreneurs from the other two groups, but to be a poor discriminator between the contract-commercial group and the contract group.

The next step in the analysis involves computing the eigenvalues of the matrix $W^{1/2}BW^{1/2}$, where B is the between-groups sums of cross-products and W is the pooled (within-groups) sum of squares (Dixon and Brown 1979:718). From the eigenvalues canonical variables are computed. The first canonical variable "is the linear combination of the variables entered that best discriminate among the groups (largest one-way ANOVA F-statistic), the second canonical variable is the next best linear combination orthogonal to the first" (ibid). The group means of the canonical

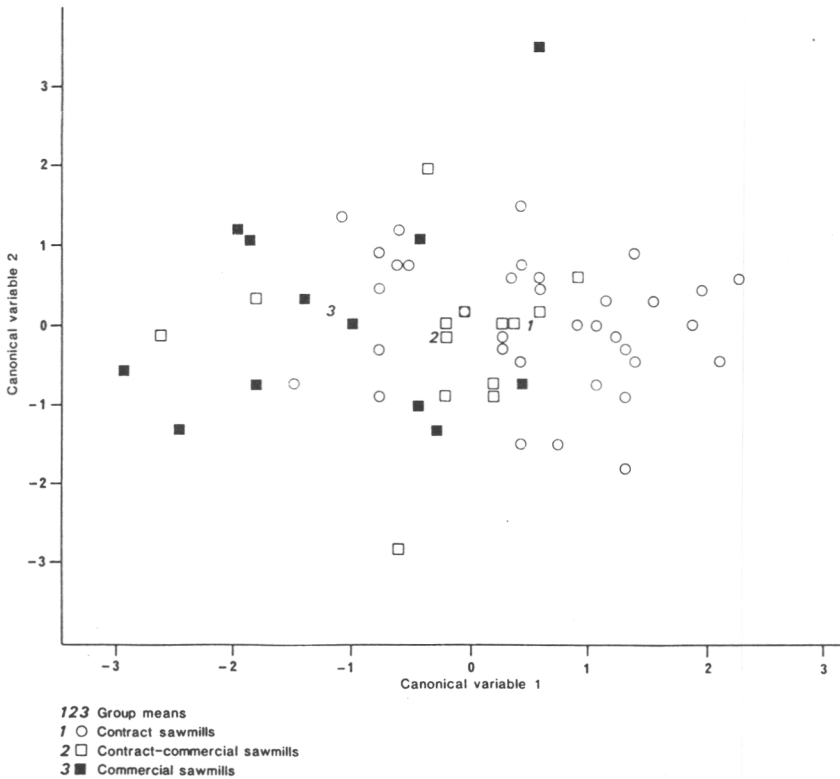


Figure 4.2. Location of the group means and cases in the discriminant space.

variables, and all cases are shown on the scatter plot, figure 4.2. The plot shows that, following the influence of factor B1, the contract sawmill group is fairly well separated from the commercial sawmill group. The contract-commercial sawmill group, on the other hand, is poorly separated. This result partly reflects the actual "in between" status of the contract-commercial sawmill group, but it also reflects the considerable effect of three outliers. It is a characteristic of discriminant analysis that outliers have a disproportionately serious effect compared with other multivariate techniques. The effect of the outliers is even greater because of the small number of cases involved. The discriminant analysis has therefore upheld the original interpretation of the basic factor model. The basic factor model, supported by group-wise factor models, indicated the presence of a behavioural continuum. The discriminant analysis has demonstrated, on the basis of approved statistics, that i) the scores accurately translate the mathematical and interpretational structures of the factors, and ii) that the interpretations of the factors are valid with respect to the frame of reference and with respect to the known characteristics of the groups in question.

5. A BEHAVIOURAL MODEL OF THE PERCEIVED ENVIRONMENT

5.1. Perceived environments and the location of the enterprise

Part of the frame of reference concerned the perceived environment and how the entrepreneur behaves with respect to this environment. Perception was considered to be a learned attribute; a product of cultural background, education and experience, modified in turn by the psycho-philosophical make-up of the individual. The cultural background is considered to include the influence of the degree of socio-economic development of the society in question, i.e. the society's location on a traditional-modern (Gesellschaft-Gemeinschaft) continuum. Two social environments are identified in the present investigation, scattered, or isolated settlements, and commune centres. The former group, under the circumstances relevant to North Karelia, consists of scattered settlements, small villages and isolated farms; the latter group consists of the large villages, often with urban-like features, which constitute the administrative centres of the communes. The framework for considering the relationship between the perceived environment and location also requires reference to Pred's behavioural matrix concept, which links the entrepreneur's information base with his ability to use that information, see section 2.6.

In the present chapter these discussions are followed up. Based on variables which measure aspects of the business environment as perceived by the entrepreneurs (x_{15} - x_{22}), a descriptive model is constructed. Four additional variables are added to the model to represent aspects of the entrepreneur's business behaviour. These variables are marketing or activity area (x_{25}), which is interpreted as a measure of the entrepreneur's contribution to his firm, i.e. the larger the area the greater input of time and work required; information gathering (x_{23} is a

dichotomous variable indicating whether information gathering is active or passive); the number of affiliations to institutionalized professional bodies is represented by variable x_{24} ; and finally, the entrepreneur's degree of business satisfaction is given by x_{29} .

The four-factor varimax principal components model is presented in table 5.1. The four factors account for 64 % of the variance in the model. The model is interpreted as follows:

- Pe1: Perceived supply environment
- Pe2: Perceived communication and service environment
- Pe3: Perceived opportunities
- Pe4: Disturbance

Factor Pe1: Perceived supply environment

As the factor strengthens, the following changes in the environment are perceived:

- power supply is considered better (x_{21})
- the business environment is considered better (x_{19})
- raw material supply is considered better (x_{15})
- labour supply is considered better (x_{22})
- information gathering is increasingly active (x_{23})

The factor is considered to represent the perceived supply environment, especially as variable x_{23} can be interpreted in this context as the supply of information. The loading of x_{19} (business environment) on this factor suggests that this broadly defined concept is associated, in the minds of the entrepreneurs, with the supply environment.

Table 5.2 presents the scores computed for factor Pe1 tabulated against location. According to the table, only 27 % of the entrepreneurs in the scattered settlement areas perceive a satisfactory supply environment compared with 54%

Table 5.1. Varimax principal components model of the entrepreneurs perceived environment

x	Pe1	Pe2	Pe3	Pe4	h_2^4
21	0.83				0.79
19	0.81				0.82
15	0.76				0.58
22	0.74				0.64
16		0.84			0.75
17		0.73			0.64
18		0.70		-0.43	0.76
29			-0.73		0.59
25			0.67		0.55
24				0.76	0.60
23	0.48		0.46		0.55
20				-0.46	0.37
VP	2.95	2.04	1.46	1.25	

see footnote to table 4.1

Where:

- x15 = Perceived rawmaterial supply
- 16 Perceived transportation
- 17 Perceived access to markets
- 18 Perceived service environment
- 19 Perceived business environment
- 20 Perceived taxation
- 21 Perceived power supply, situation
- 22 Perceived labour supply
- 23 Information gathering
- 24 Professional affiliations
- 25 Marketing or activity area
- 29 Degree of business satisfaction

of the entrepreneurs located in centres. Similarly, 45 % of

the entrepreneurs in scattered settlements receive low scores (i.e. a less satisfactory environment) compared with 30 % of the entrepreneurs in centres. There is evidence, therefore, that the supply environment is perceived to be better in the centres. However, the chi-square statistic for the table (3.36 with d.f.=3) indicates a low probability that that the groups are really different.

Table 5.2. Scores for factor Pe1 by location

Score*	Scattered settlement		Commune centre		Total	
	No	%	No	%	No	%
Very low	0	0	0	0	0	0
Low	22	46	4	31	26	43
Average	13	27	2	15	15	25
High	9	19	5	38	14	23
Very high	4	8	2	15	6	10
Total	48	100	13	100	61	100

* See note to table 4.2

Pearson chisquare 3.36 d.f. 3 Prob. 0.339

Factor Pe2: Perceived communication and services environment

This factor is interpretationally clear. As the factor strengthens the following changes in the perceived environment occur:

- transport facilities are considered better (x_{16})
- access to markets is considered better (x_{17})
- the supply of services is considered better (x_{18})

Computing the factor scores for factor Pe2 and tabulating against location results in table 5.3. Now, 50 % of the

entrepreneurs in scattered settlement areas perceive poor environments (low scores), although 18 % perceive good or very good conditions. Of the entrepreneurs located in centres, 23 % perceive a poor environment but 69 % perceive good or very good conditions. The chi-square statistic indicates that the perceived communications and supply environment therefore acts as a location differentiator rather more strongly than the perceived supply environment.

Table 5.3. Scores for factor Pe2, by location

Score*	Scattered settlement		Commune centre		Total	
	No	%	No	%	No	%
Very low	5	10	0	0	5	8
Low	19	40	3	23	22	36
Average	15	31	1	8	16	26
High	7	15	6	46	13	21
Very high	2	4	3	23	5	8
Total	48	100	13	100	61	100

* See footnote to table 4.2

Pearson chisquare 13.53 d.f. 4 Prob. 0.008

Factor Pe3: Perceived opportunities

Factor Pe3 is considered to be a behavioural factor. As the factor strengthens the following changes occur:

- the marketing or activity area increases (x_{25})
- information gathering becomes more active (x_{23})
- the level of business satisfaction decreases (x_{29})

The strongest variable on the factor is the negatively loaded x_{29} (degree of business satisfaction). When this

variable is interpreted as an inducement variable, and the two other variables are interpreted as contribution variables, the factor can be considered to concern motivation. Thus, the lower the entrepreneur's degree of business satisfaction, the less he can be considered to be achieving his aspirations. His aspired goal can only be achieved by contributions to his firm, represented here by an extended marketing area and an active seeking for information. The scores computed for factor Pe3 are tabulated against location in table 5.4. According to the table, 45 % of the entrepreneurs in the centres are strongly motivated, whereas only 18 % of the entrepreneurs in the scattered settlement areas can be considered to be similarly motivated. Conversely, 44 % of the entrepreneurs in scattered settlement areas received low scores, indicating lower activity levels and higher levels of satisfaction, whereas only one (7 %) of the centrally located entrepreneurs received a low score. The statistical test of the tabulation indicates a high level of confidence that the locations are well differentiated by factor Pe3.

The centres therefore create a perceived environment which stimulates motivation by tending, by implication, to raise levels of aspiration and therefore to lower levels of satisfaction. This result justified examining the relationship between variable x_{29} alone and the location of the entrepreneur, table 5.5. While the levels of satisfaction are seen to be high in both central and scattered locations, the significant feature of table 5.5 is that only 6 % of the entrepreneurs in the scattered settlements register dissatisfaction whereas, 23 % of the entrepreneurs in the centres claimed to be dissatisfied or very dissatisfied. The table, with fairly good statistical confidence, supports the argument that entrepreneurs in the centres have higher aspirations than the entrepreneurs in the scattered settlements. This is shallow evidence, but it is tempting to relate this result

Table 5.4 Scores for factor Pe3 tabulated against location

Score*	Scattered settlement		Commune centre		Total	
	No	%	No	%	No	%
Very low	1	2	0	0	1	2
Low	20	42	1	8	21	34
Average	18	38	6	46	24	39
High	6	12	4	31	10	16
Very high	3	6	2	15	5	8
Total	48	100	13	100	61	100

* See footnote to table 4.2

Pearson chisquare 7.01 d.f. 4 Prob. 0.134

Table 5.5 The degree of business satisfaction of the entrepreneur by location

Satisfaction	Scattered settlement		Commune centre		Total	
	No	%	No	%	No	%
Very dissatisfied	0	0	1	8	1	2
Dissatisfied	3	6	2	15	5	8
Cannot say	9	19	2	15	11	18
Satisfied	35	73	8	62	43	70
Very satisfied	1	2	0	0	1	2
Total	48	100	13	100	61	100

Pearson chisquare 5.52 d.f. 4 Prob. 0.262

with the effects of the traditional-modern social continuum discussed earlier. By trimming aspirations to the norms of the more traditional society, the entrepreneur in scattered settlement areas (i.e. more rural areas) avoids the stresses required to satisfy the inflated aspirations generated by the more modern environment of the commune centres. Free of such stresses, he is more satisfied, or at least invokes dissonance theory to remove possible frustrations.

Factor Pe4: Disturbance

The fourth factor in the present model raises some interesting questions. Strongly and positively loaded on the factor is x_{24} (number of professional affiliations); negatively loaded are x_{20} (perceived taxation level) and x_{18} (perceived services). Thus, as the factor strengthens, the number of professional affiliations increases, but the perceived taxation level and perceived services deteriorate. It therefore appears that increased contacts with institutionalized professional interest groups increases the entrepreneur's dissatisfaction with the service environment, and with statutory taxation. The "disturbance" interpretation is given to the factor following the discussion by Butt (1979;43-47) concerning the role of "approved pressure groups" in the corporate state which, he argues (ibid;46) have deflected social policy from the individual social good to their own sectorial interests, which in turn are frequently minority interests. These "interest groups" operate at the national level, and it is therefore unlikely, in the present case, that the small-scale operator is fully represented. Consequently, the "weakest" members of professional interest groups will receive information which applies more to the stronger members, who will often be operating in more ideal environments. The small-scale operators will therefore be "disturbed" by a flow of information which will falsely raise their aspirations and so create dissatisfaction with

their own perceived environment. We shall return to this argument shortly, and its relevance to the behavioural models constructed in chapter 4 will become apparent. The tabulation analysis of the factor score against location (not shown) indicated that the factor behaved similarly for both location types. This result supports the "disturbance" interpretation because the scale of operations does not differ significantly between the two locations when compared to the larger producers in the "interest group".

Factors Pe1-Pe3 were entered into discriminant analysis to test their discriminatory power with respect to location. Factor Pe4 was omitted at the outset because of its extremely low chi-square value in the tabulation analysis. The three remaining factors gained the following F-to-enter values: Pe1=1.42, Pe2=12.72 and Pe3=7.94. As F-to-enter was set a a minimum of 2.00, Pe1 was rejected from the analysis. Accordingly, the perceived supply environment, as represented by Pe1, does not vary considerably between entrepreneurs in scattered settlements of those in centres. The discriminant classification functions are shown in table 5.6.

Table 5.6 Discriminant classification functions
for the perceived environment factor model
with respect to location

	Scattered settlement	Commune centre
Factor Pe2	-0.30	1.12
Factor Pe3	-0.24	0.91
Constant	-0.74	-1.44

The scattered settlement group receives negative coefficients for both factors, while the centre group

receives positive coefficients. Thus, the communications and services factor (Pe2) discriminates the entrepreneurs in the centres from those in the scattered settlements, and similarly for the motivation factor (Pe3). This result, not unexpectedly, follows the tabulation analysis results for the factors concerned. The accuracy of the discriminant classification is shown by the classification matrix, table 5.7. The table shows that 78 % of the cases are correctly classified by the discriminant classification functions. The accuracy of the classification is high, with the accuracy of the scattered settlement group being slightly better (79 % correct) than for the centrally located group (77 % correct). The classification matrix can, in fact, be interpreted with respect to Pred's behaviour matrix, discussed earlier. Thus, the misclassified three entrepreneurs located who are in the centres,

Table 5.7 Classification matrix of the discriminant analysis for perceived environments with respect to location

Group	Correct %	Number of cases classified into groups:	
		Scattered settlement	Commune centre
Scattered settlement	79.2	38	10
Commune centre	76.9	3	10
Total	78.7	41	20

but perceive their environment more as entrepreneurs located in scattered settlements, can be considered to lack information concerning their true environment or they lack the ability to use information. Similarly, the ten

their environment as those entrepreneurs located in centres are either located in very favourable circumstances, or they perceive their environment in over-optimistic terms. This may also be due to a lack of information or a lack of ability to use information, or its may be due to their having sufficiently low levels of aspiration to easily reach their desired level of satisfaction. Following the discussion concerning factor Pe3, above, the influence of social norms and dissonance theory can also be invoked to explain the exaggeration of the perceived environment on the part of some entrepreneurs in scattered locations. Thus, in "making-do" within the confines of the social environment the entrepreneur compensates his lower level of aspiration and achievement by "colouring" or "inflating" his perceived environment. It is argued, therefore, that the dissonance being applied here stems from an interaction of the traditional values of an essentially primary production society with the values and norms of an incipient secondary and tertiary oriented society. The entrepreneur oriented towards the secondary sector society, but located in a primary sector (traditional) society, will tend to be regarded as a non-conformist. Depending on his personal psycho-philosophical constitution, therefore, he will either balk at the traditional norms, or he will adjust his aspirations to local levels. In such a case, there is no social advantage to the entrepreneur if he perceives an environmental potential which is in excess of the locally perceived norm.

The accuracy of the discriminant classification indicates that the majority of the entrepreneurs, irrespective of their location, accurately relate the their perceived environments. This in turn implies that the entrepreneurs, with due reference to dissonance, are boundedly rational. This contention will now be examined in more detail.

5.2. Perceived environments and the type of sawmill

In pursuing the discussion on the perceived environment and the entrepreneur's behaviour with respect to his perceptions, we return to the varimax model discussed in the previous section, but applied now to sawmill types rather than to location. Recapitulating, it has been established that the commercial sawmill can be considered to be located at one end of an activity continuum and the contract sawmills at the other. It can be expected that the commercial sawmill operator will perceive an environment of greater potential than that perceived by the contract sawmill operator, for without this greater perception the commercial sawmill entrepreneur cannot be expected to have made the necessary contributions to his firm to enable it to provide him with a sustained income.

Table 5.8 Scores for factor Pe1 (Perceived supply environment), by sawmill type

Score*	Contract sawmills		Contract-commercial sawmills		Commercial sawmills		Total	
	No	%	No	%	No	%	No	%
Very low	0	0	0	0	0	0	0	0
Low	26	74	0	0	0	0	26	43
Average	6	17	7	50	2	17	15	25
High	3	9	5	36	6	50	14	23
Very high	0	0	2	14	4	33	6	10
Total	35	100	14	100	12	100	61	100

* See note to table 4.2

Pearson chisquare 42.51 d.f.6 Prob. 0.00

Referring to Pred's behaviour matrix, it is assumed that the commercial sawmill entrepreneur has acted in a boundedly rational way in the establishment of his enterprise, in that he has acquired information about his environment, thereby extending his environmental perception; and further, the entrepreneur is assumed to have been able to use his knowledge. Following Wolpert (1964), however, it is not considered necessary that the knowledge acquired is perfect, nor is it necessary to assume that the entrepreneur has perfect ability to use his knowledge. Thus, returning to the perceived environment model, and factor Pe1 (perceived supply environment), it can be expected that the commercial sawmill entrepreneur will perceive good supply conditions. Table 5.8 demonstrates the validity of this expectation. Over 80 % of the commercial sawmill entrepreneurs perceive the supply environment to be good, so do 50 % of the contract-commercial sawmill entrepreneurs. Of the contract sawmill entrepreneurs, however, only 8 % perceive a satisfactory supply environment, i.e. only 8 % receive high factor scores. However, it is to be remembered that the contract sawmill entrepreneurs are not involved with sawtimber procurement.

The situation with respect to factor Pe2 (perceived communications and services) is shown in table 5.9. Here again the expectation that the commercial sawmill entrepreneurs perceive a better environment with respect to communications and services is supported. Fifty-eight percent of the commercial sawmill entrepreneurs, 28 % of the contract-commercial and 20 % of the contract sawmill entrepreneurs perceive a satisfactory environment with respect to communications and services. The results of both tables 5.8 and 5.9 therefore strongly support the expectation that the commercial sawmill entrepreneurs are boundedly rational with respect to their perceived environments. The low percentage of commercial sawmill entrepreneurs receiving low scores with respect to factor Pe1 and Pe2 further support this argument.

Table 5.9 Scores for factor Pe2 (Perceived Communications environment), by sawmill type

Score*	Contract		Contract-commercial		Commercial		Total	
	No	%	No	%	No	%	No	%
Very low	0	0	4	29	1	8	5	8
Low	19	54	2	14	1	8	22	36
Average	9	26	4	29	3	25	16	26
High	3	9	3	21	7	58	13	21
Very high	4	11	1	7	0	0	5	8
Total	35	100	14	100	12	100	61	100

* See note to table 4.2

Pearson chisquare 29.45 d.f. 8 Prob. 0.00

In table 5.10 the behaviour of the entrepreneurs with respect to perceived opportunities, factor (Pe3), is examined. Again referring to the entrepreneurial continuum, it is to be expected that the commercial sawmill entrepreneurs will aspire to a higher level of commercial activity than the contract sawmill entrepreneur. This will be reflected in their contributions to their firms, and in their degree of satisfaction. It is to be expected that the degree of satisfaction will be in negative correlation with aspirations until such times as aspirations are fulfilled. When interpreting table 5.10, it is to be recalled that as the factor strengthens, the marketing area and information gathering increases, and satisfaction decreases. Cases with high scores have larger marketing areas and more information, but less satisfaction. Low scores mean a smaller marketing area and less information, but greater satisfaction. This result already supports the above

argument concerning the relationship between aspirations (leading to increased activity) and satisfaction.

Table 5.10 Scores for factor Pe3 (Motivation),
by sawmill type

Score	Contract		Contract- commercial		Commercial		Total	
	No	%	No	%	No	%	No	%
Very low	1	3	0	0	0	0	1	2
Low	11	31	9	64	1	8	21	34
Average	19	54	2	14	3	25	24	39
High	4	11	0	0	6	50	10	16
Very high	0	0	3	21	2	17	5	8
Total	35	100	14	100	12	100	61	100

Table 5.10 shows that 66 % of the commercial sawmill entrepreneurs receive high scores, compared to 21 % of the contract-commercial sawmill entrepreneurs and only 11 % of the contract sawmill owners. Conversely, 34 % of the contract sawmill entrepreneurs 64 % of the contract-commercial sawmill entrepreneurs receive low scores, but only 8 % of the commercial sawmill owners. Thus the commercial sawmill owners operate over a wider area and with more information, but they are generally less satisfied. The least active and least informed are the contract-commercial sawmill entrepreneurs, but they are also the most satisfied. The analysis does not explain this interesting result, but it would seem that the contract-commercial sawmill entrepreneurs' high degree of satisfaction may stem from the fact that they are diversified, i.e. their production is not wholly geared up to the competitive commercial markets. A considerable part of the contract-commercial sawmills production is accounted

for by contract sawing.

It was argued in section 5.1, that factor Pe4 (Disturbance), represented the negative influence of the small-sawmill entrepreneurs' institutionalized "interest groups" in which he may well be misrepresented. It follows from the frame of reference that boundedly rational entrepreneurs will be likely to seek affiliation to such groups, with the aim of moving diagonally across Pred's behaviour matrix, so i.e. that they can receive more information and be more able to use that information. They may also gain some imagined security from group membership. Factors Pe1-Pe3, above, have indicated that the commercial sawmill entrepreneurs are more active, and that they tend to be boundedly rational with respect to their perceived environment. Following this, it can be expected that commercial sawmill entrepreneurs will also seek professional affiliation to obtain information. However, with professional affiliation will come increased dissatisfaction with their perceived environments. It is also likely that the competitive entrepreneur will, as a learned reponse, become increasingly critical of taxation. Table 5.11 supports the above interpretation. The table shows that 58 % of the commercial sawmill entrepreneurs receive high scores from factor Pe4, there by lending support to the above hypothesis.

Subjecting the factors scores Pe1-Pe4 to discriminant analysis, with sawmill type as the a priori grouping variable, yields the values: Pe1=41.76, Pe2=2.19, Pe3=7.19 and Pe4=0.49. As the minimum F-to-enter is set at 2.00, factor Pe4 is rejected from the analysis despite its good statistical performance in table 5.11. The discriminant classification functions for the remaining variables are shown in table 5.12. The signs of the functions accord with

Table 5.11 Scores for factor Pe4 (Disturbance),
by sawmill types

Score	Contract		Contract- commercial		Commercial		Total	
	No	%	No	%	No	%	No	%
Very low	1	3	3	21	1	8	5	8
Low	9	26	4	29	1	8	14	23
Average	17	49	1	7	3	25	21	34
High	7	20	4	29	6	50	17	28
Very high	1	3	2	14	1	8	4	7
Total	35	100	14	100	12	100	61	100

Pearson chisquare 15.95 d.f. 8 Prob. 0.04

Table 5.12 Discriminant classification functions of the
perceived environment factor model with respect
to sawmill types

x	Group		
	Contract	Contract- commercial	Commercial
Factor Pe1	-2.22	1.64	4.58
Factor Pe2	-0.33	-0.16	1.17
Factor Pe3	-1.03	0.27	2.70
Constant	-1.93	-1.62	-5.17

those expected on the basis of the factor interpretations and cross-tabulation analyses discussed above. The contract sawmill entrepreneurs receive negative coefficients for each of the three discriminant variables, whereas the commercial sawmill group receives strong positive coefficients for all variables. The contract-commercial sawmill entrepreneurs,

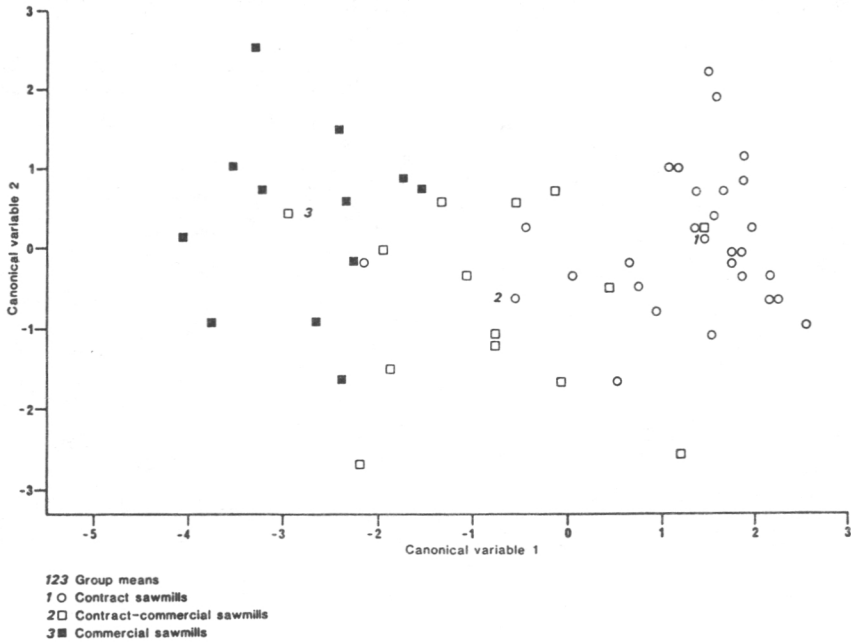


Figure 5.1 Location of the sawmill entrepreneurs in the discriminant space derived from perceive environment variables

located half-way along the typological continuum, receive a strong positive coefficient for Pe1 (perceived supply environment), and a weak positive coefficient for Pe3 (motivation), but the contract-commercial group receives a weak negative coefficient for Pe2 (perceived communications and services). The latter result reflects the greater degree of business satisfaction of the contract-commercial group, as discussed above. The discriminant analysis of the factor scores confirm that the sawmill entrepreneurs are situated on a continuum both with respect to their sawmill activities and with respect to their perceived environments. This continuum is shown in figure 5.1. According to the discriminant classification, 82 % of the sawmill

entrepreneurs are classified correctly, table 5.13. According to this table, only one commercial sawmill entrepreneur is misclassified on the basis of the discriminant classification functions. The accuracy of the other classifications is not quite so high.

Table 5.13 Classification matrix of the discriminant analysis for perceived environments with respect to sawmill types

Group	Percent Correct	Number of cases classified into group:		
		Contract	Contract-commercial	Commercial
Contract	85.7	30	4	1
Contract-commercial	64.3	3	9	2
Commercial	91.7	0	1	11
Total	82.0	33	14	14

This result again indicates that the commercial sawmill entrepreneurs are behaving in a boundedly rational way with respect to their perceived environments. The contract-commercial sawmill entrepreneurs are least successfully classified by the discriminant functions, with only 64 % correctly classified. This is presumably partly due to their location on the continuum, together with their dual specification, but it also indicates that these entrepreneur as a group, tend to possess lower aspirations, hence the weak negative classification coefficient from factor Pe3, and motivated therefore are not to be so rational in their actions with respect to their perceived environments.

6. CONCLUDING COMMENTS

The empirical analysis has been concerned with small-scale entrepreneurial behaviour in rural areas. The initial, intuitive assumptions were that firm structure, entrepreneurial behaviour and the socio-economic environment are linked by means of the entrepreneur's perception, his aspirations, his level of satisfaction and his bounded rationality. The assumption was supported by a strongly eclectic frame of reference which at the outset adopted a humanistic rather than a positivistic stance. It was argued that the methodological restrictions imposed by positivistic thinking would restrict or exclude the use of mental variables in the analysis. It was considered methodologically important that mental and physical variables should be given equal status in the investigation. The validity of this approach, it is contended, is justified by the stable and interpretationally meaningful models constructed in the empirical analysis. The analysis is therefore itself an eclectic mix of positive and subjective (humanistic) interpretations based on real-world cases and observations. A further advantage of the humanistic approach is the ability to avoid some of the stricter requirements demanded by positive analytical techniques, particularly with respect to measurement. Since Boulding (1956) introduced the environmental image concept, there has been considerable debate as to whether or not individuals' environmental perceptions can be measured or not. In particular, it has been argued that perception research has not provided a new coherent body of theory, nor has it added significantly to the understanding of man-environment relationships. Following Bunting and Guelke (1979;452) it would appear that the main reason for this failure is that researchers have tended to concentrate their attention on measuring the image rather than the behavioural consequences of such images. It is contended that the research in hand avoids such criticism by relating the perceived environmental factors to the real-world activities of the

entrepreneurs in question. After all, the basic assumptions of perceptual and behavioural geography are that the discipline should clarify and elucidate the interrelationships between an individual's perceived world and his actual behaviour. In this respect, Bunting and Guelke (1979;453) note, in this investigator opinion correctly, that

The basic premise that individual decision-making and actual or real-world behaviour can be better understood in terms of perceived images and subjective evaluations of the environment seems quite sound...

Bunting and Guelke argue further that the criticism of image research is not that subjective images exist, but rather that such images are not readily or accurately measured. This problem stems, to a large extent, from a lack of any standards for measuring elusive mental phenomena such as environmental images. The situation is further complicated by the fact that images of the environment do not exist in isolation. They are a product of social, political and economic ideas; i.e. they are a product of culture, education and the psycho-philosophical make-up of the individual. This investigator concedes the point made by such criticism. No attempt is made in the present study to justify or defend the use of the variables selected other than to say that they have been demonstrated to be serviceable, and that they intuitively suite the present research problem.

It is argued (cf. Bunting and Guelke, op cit) that research into the behavioural relationship between man and environment requires a change in emphasis away from the image, to the relationship between cognitive behaviour and overt behaviour. Thus, the emphasis should be placed on individual activities. Here again, it is contended that the present investigation succeeds, at least in part, in this respect. A criticism that might be levelled at the present

investigation is its limited scope. Human behaviours, either cognitive or overt, do not occur in isolation. The models constructed here in no way attempt to go beyond the entrepreneurial activity in question, or do they attempt to include all aspects of the perceived environment. That having been said, it can be argued that the fairly broad interpretability of the attitudinal variables employed in the investigation goes at least some way to meet the criticism of too narrow a perspective. Further, the multivariate techniques employed in the analysis answers the criticism of Bunting and Guelke (op cit;457) that the methodology should not sacrifice the intricacies of individual behaviour to simple statistical correlates. The methodology employed in the present investigation has used variables which have concerned the subjects' attitudes, environmental images, and aspects of their real-world behaviour as entrepreneurs, and have permitted these attributes to be related in interpretationally meaningful ways with known degrees of statistical confidence.

It is at this juncture that the eclectic nature of both the frame of reference and empirical analysis can be seen to advantage. The statistical analyses offer results which can be treated with a measurable confidence, and which fit into the current scientific paradigm. The methodology is never-the-less given a broader scope by the addition of the mental variables which might otherwise have been excluded by a strictly positivistic analysis. The mental variables also play an important role in revealing some of the relationships between cognitive behaviour and overt behaviour, although the present investigation does not go deeply into the study of such links. Similarly, the present investigation does not examine the relationship between the objective environment and the perceived environment. Both of these behavioural relationships are the subject of the on-going investigation and will be reported in due course. Suffice it to say that a preliminary model of the objective environment in North Karelia has been constructed and it

would appear that small sawmill activities are rational with respect to the economic and social environment in which they operate (Selby 1983), but no further comment is justified at this juncture. The preliminary result none-the-less supports the findings of the present investigation that the small-scale entrepreneurs in question are boundedly rational particularly when considering the commercial sawmills. Haggett (1965;182) writes that

The spectre of sub-optimal behaviour dogs all discussion of the classic normative models...We clearly need more locational models to be based on satisficer rather than optimizer principles.

Wolpert (1964) amply demonstrates the validity of this statement. In his investigation into the potential productivity of Swedish farmers, Wolpert (ibid;544) admits to having been required to relax all the assumptions of economic rationality in order to account for the spatial variations encountered. Not only were the farmers sub-optimal in their behaviour, they did not even attempt to optimize. In the present investigation similar results are obtained. While there is evidence that the small-scale entrepreneurs are boundedly rational with respect to their perceived environments, there is little evidence of attempts to optimize, but substantial evidence to support the sufficing principle as a central tenet of entrepreneurial motivation.

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Appendix 1: Means and standard deviations of variables,
by sawmill groups

X	ALL MILLS		CONTRACT MILLS		CONTRACT-COMMERCIAL MILLS		COMMERCIAL MILLS	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
1*								
2	3.21	1.49	3.42	1.50	3.07	1.43	2.75	1.54
3	3.88	1.33	4.02	1.29	4.28	0.99	3.00	1.47
4	4.47	0.86	4.65	0.68	4.00	1.17	4.50	0.79
5	3.85	1.18	3.71	1.31	3.92	0.82	4.16	1.11
6	3.42	1.45	3.45	1.55	3.14	1.09	3.66	1.55
7	4.42	0.88	4.60	0.73	4.21	1.05	4.17	1.03
8	3.13	1.50	3.20	1.34	3.07	1.73	3.00	1.75
9	3.03	1.39	3.00	1.28	3.14	1.35	3.00	1.80
10	3.24	1.24	3.25	1.26	3.14	1.23	3.33	1.30
11	3.96	1.12	4.05	1.02	4.00	0.96	3.66	1.55
12	2.18	1.19	2.31	1.10	2.21	1.25	1.75	1.35
13	3.55	1.02	3.77	0.91	3.21	0.97	3.33	1.30
14	3.63	1.30	3.91	1.19	3.50	1.22	3.00	1.53
15	3.83	0.95	3.25	0.65	4.71	0.46	4.50	0.90
16	3.62	1.05	3.45	0.85	3.57	1.39	4.16	1.03
17	3.54	0.88	3.40	0.81	3.35	1.00	4.16	0.71
18	3.47	0.97	3.34	0.72	3.21	1.31	4.16	0.93
19	3.62	0.77	3.17	0.51	3.92	0.61	4.58	0.51
20	3.06	0.75	3.05	0.53	3.21	0.89	2.91	1.08
21	3.71	0.94	3.17	0.51	4.21	0.97	4.91	0.28
22	3.73	1.01	3.31	0.71	3.92	1.32	4.75	0.45
23	1.14	0.35	1.00	0.00	1.07	0.26	1.66	0.49
24	1.44	1.10	1.45	1.09	1.35	1.27	1.50	1.00
25	3.09	0.85	2.88	0.83	3.14	0.94	3.66	0.49
26	0.97	1.10	0.66	0.36	0.69	0.43	2.20	2.00
27	14.73	30.19	0.00	0.00	39.00	39.26	29.4	38.42
28	1.21	0.41	1.17	0.38	1.07	0.26	1.50	0.52
29	3.62	0.73	3.71	0.51	3.64	0.74	3.33	1.15
n =	61		35		14		12	

* Grouping variable

ISBN 951-40-0957-6

ISSN 0358-4283