

The Analysis of Strategic Groups of Firms

Hans H. Hinterhuber

Professor and Head of Department of University of Innsbruck

Martin Kirchebner

Assistant Professor in the Department of Management, University of Innsbruck

Competitive behaviour exhibited by firms operating in the same industry can differ greatly. There are some strategic conceptions, according to which it may be possible to differentiate different strategic groups of firms from each other in any industry. The fundamental strategic conceptions are cost leadership and product differentiation.

Firms in competition with each other handle the competitive aspects of their activities in two ways, first by competing with firms which belong to the same strategic group, and second by competing, together with the competitors in their own groups, with firms whose identity lies in other strategic groups.

The success of a businesses strategy, therefore, depends on the ability of a firm to protect its strategic business unit from both sorts of competition as appropriate. The study on which this paper is based aims to demonstrate a method whereby an analysis of strategic groups of firms can be built.

The applicability of this methodology has been tested by empirical research in the Tyro-

lean building industry. The paper shows the consequences of analysing strategic groups as a means of formulating competitive strategy. It concludes with some ideas for future research.

Competitive Analysis

The analysis of competition can be regarded on the one hand as a range of studies defined by the general analysis of industries, and on the other as the analysis of individual firms. The analysis of strategic groups of firms comes between those two extreme fields of investigation.

In order to define a strategic group, we need to be able to identify several competitors who show similar qualifications and behaviour based upon such factors as the degree of specialization of their technology, the quality and range of products offered, their production processes, the relationships of buyers to suppliers and geographical coverage.

There are three forms of how strategic groups may operate in an industry. These are where:-

An industry consists of only homogeneous firms, i.e. all firms have similar behaviour along the components of strategic analysis.

An industry includes several strategic groups. This appears when homogeneous groups are working in a heterogeneous industry.

An industry consists of as many groups as there are a number of firms. This means that all firms have different strategies based on their own individual capabilities.

Existing Studies of Strategic Analysis

Stephen Rhoades investigated the hypothesis that diversification was an element of industry structure which increased entry barriers. (1) He investigated 241 manufacturing industries using multiple regression analysis. (For a note on multiple regression analysis see the Appendix to this article). His results showed that when relationships amongst the characteristics defining competitive groups and entry barriers were emphasised, then they prevented mobility between groups. Therefore we may conclude that the characteristics of strategic groups may be related to diversification.

Howard Newmans hypothesis was that significant

difference in market shares amongst competitors in an industry indicated strategic differences was incorrect and that the complex structure of strategic groups was an important element. (2) His research includes 34 chemical companies which he classified as homogeneous or heterogeneous.

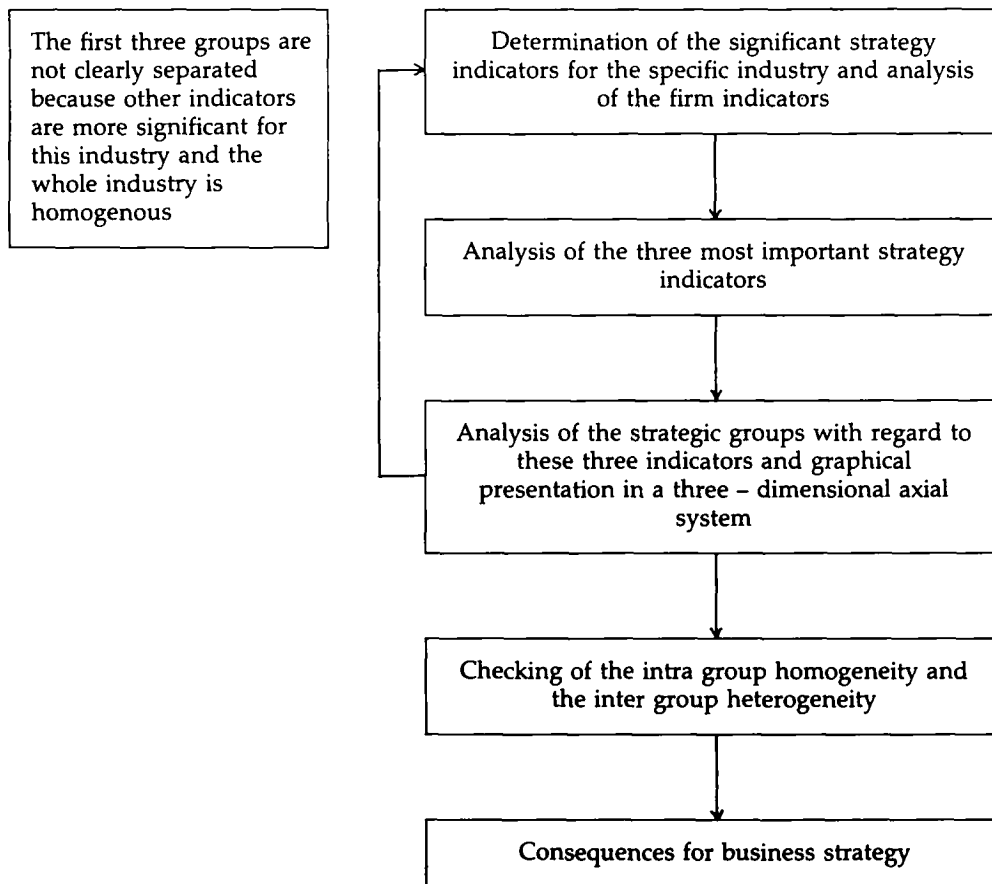
His research indicated that his basic hypothesis was correct, namely that the more complex structure of strategic groups was more important than shares of market, and that the important variable was the existence of a stronger competitive efficiency in an industry.

Thirdly Michael Porter examined the questions of what other factors exist for the determination of strategic groups. (3) He suggested a framework for the determination of strategic groups of firms as follows:

The first discriminator is differences which may be observed in the competitive behaviour of the firms.

The creation of a matrix as a tool of presentation of the different strategic groups.

DIAGRAM 1
FIVE STEP ANALYTICAL MODEL



Checking the presentation against factors such as mobility barriers, the strengthening of bargaining power, substitution and the behaviour of competitors in an industry.

A Model for Analysis of Strategic Groups of Firms

Based on the foregoing studies it is possible to construct a five stage model.

With the help of this model, it is possible to analyse strategic groups of firms and draw the consequences for formulating strategy.

The Five Steps of Strategic Group Analysis

Step 1. Determination of the significant strategy indicators for the specific industry and analysis of the firm indicators.

This step is necessary because each industry has its own specific strategy indicators. For each industry the significant strategy indicators have to be found and for that an exact knowledge of the industry is necessary. After this, firms have to be checked with regard to these indicators. This can be done by questionnaires or by interviews.

Whilst there is a wide range of possible strategic indicators, the types which are useful may be illustrated by those demonstrated for the building industry below, i.e., sales, specialization, relationship to buyers, relationship to suppliers, geographical market, technology and price policy.

Step 2. Analysis of the three most important strategy indicators

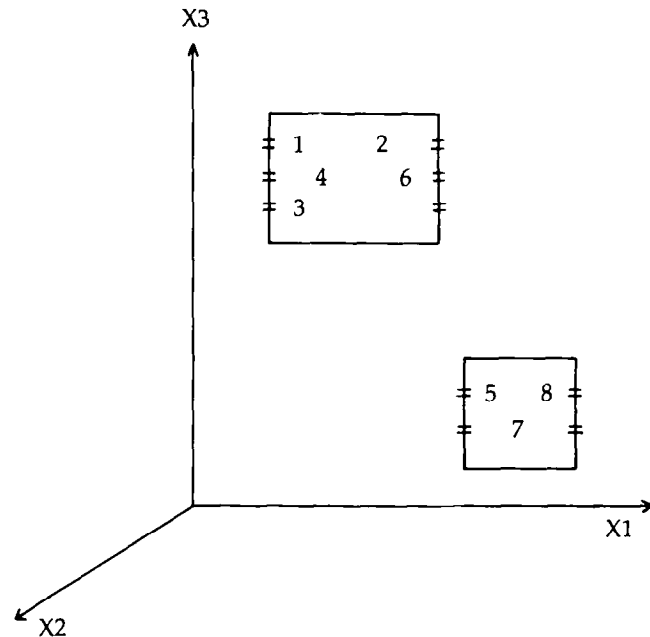
Through the use of the multiple regression analysis we may obtain regression coefficients, which show the degree of influence of the indicators in the model. The variable with the most significant regression coefficients also exert the biggest influence on the dependent variables.

For the axes of the graphical presentation in the next step, the three most important indicators for strategic analysis are used. Three dimensions are chosen in order to make a graphical presentation.

Step 3. Analysis of the strategic groups with regard to these three indicators and graphical presentation in a system of three-dimensional axes.

The three most important indicators are the basis for analysing strategic groups of firms.

Those firms which have similar values on these three dimensions are classified as forming one group. After this classification, a graphical presentation is made, thereby the axes are the three most important indicators for the strategy. This process is shown in Diagram 2



Step 4. Checking of the intragroup homogeneity and the intergroup heterogeneity.

The check for homogeneity within the strategic groups of firms can be done with multiple regression analysis.

The quality of the regression coefficients B in the model are measured by the correlation coefficients R^2 . The firms within one strategic group should show a great homogeneity in the function context, although they have only been formed by three indicators.

Checking the heterogeneity between groups can be done in the same way as above.

Here we do not examine firms within one strategic group but firms of different strategic groups.

Step 5. Consequences for formulating business strategies.

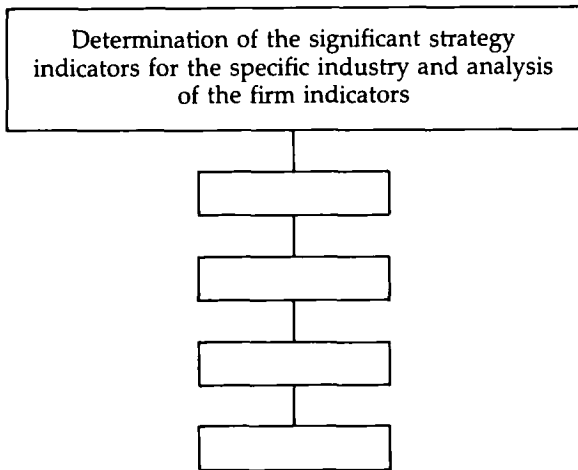
The interpretation of the results and the consequences for formulating business strategies depend on

the results of the analysis and therefore can only be evaluated in the specific circumstances under which a firm competes.

Application of the Model

The applicability and the predicability of the model have been tested in 18 firms in the building industry.

Step 1.



The selection of the central success factors for the strategic decisions in an industry has to be done carefully. Seven factors have been chosen.

Sales: The sales volume has been chosen as a dependent variable. Although the sales volume is not an optimal criterium it is better than the profit, which can be manipulated by fiscal policies and other actions (reinvestment, anticipated depreciations etc).

Specialization: The specialization degree of a firm is an important indicator in the building industry. There are many functions (road construction, surface building etc) and many firms are specialized in only few of these functions.

Relationship to buyers: The relationship to buyers is important in each industry. The buyers in the building industry are a determining force of the strategy, because the buyers influence the sales volume in different ways either in public or private works.

Relationship to suppliers: The supply belongs to

the external functions of the firm. The influence of a supplier depends on the relationship between his supply quantity and the quantities provided by other suppliers.

The selection of the right suppliers also depends on factors such as supply capability, location of the supplier site, supply conditions and delivery time.

Geographical market: The region in which a firm is working sometimes influences his building activity (e.g. because of rising tourist traffic), while in another region there is only little building activity.

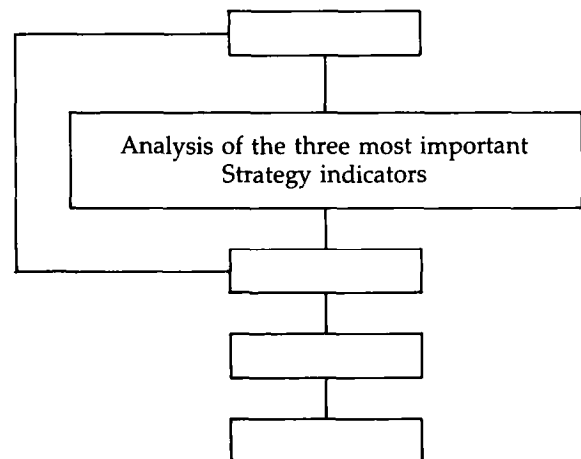
Technology: A modern technology influences the construction capabilities, the responsiveness and the quality of a firm.

If a firm has many new, high technology building machines it can execute more jobs. Technology also is an image indicator.

Price Policy: Price policy includes activities, with which the prices in the market can be enforced against the competitors.

The strategy indicators were defined as relationships because of the different detailed information on the firms.

Step 2.



The analysis of the three most important strategy indicators can be done with the help of multiple regression analysis. The standardized regression coefficients show the respective part of the independent, explaining variable in relation to the dependent variable, e.g. sales volume. The most signifi-

Definition of Strategy Determinants**Dependent variable**

Y = sale volume

Independent, explaining variable.

X1 = Degree of specialization.

Number of workers working primary in a part of the building trade / total number of workers of the firm

X2 = relationship to buyers.

Private jobs / total jobs
(rest are public jobs)

X3 = Relationship to suppliers.

Supply of raw materials e.t.c. from one main supplier / total suppliers of the firm

X4 = Geographical market.

Km² region, where the firm is working / area of analysed market

X5 = Technology.

New acquisitions (buying, leasing e.t.c.) of construction machines during 1977 – 1982 / total construction machines of the firm

X6 = Price policy

executed jobs / tenders received

cant B-values are those of the variables X1, X2 and X6, which means degree of specialization, the relationship to buyers and the pricing policy, which have the greatest influence in the model.

This is interpreted as follows. The degree of specialization has negative influence on the sales. That means, when a firm is limited on a part of the construction-trade then the sale is small. One argument for this result is, that the construction machines are nowadays conceived so, that they can be used in all parts of the construction-trade; a specialized firm has to renounce to other uses outside of its sphere of activity.

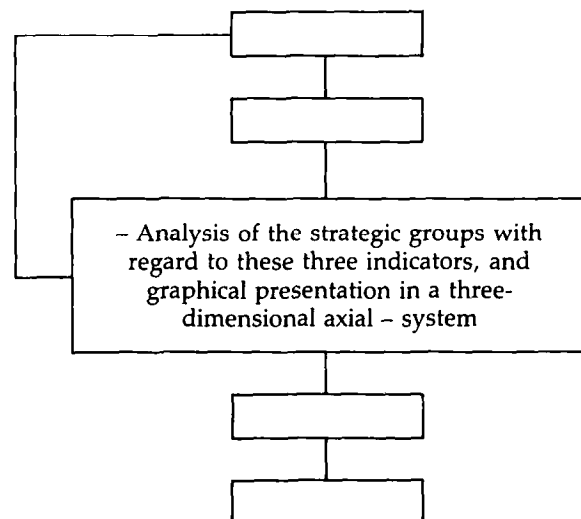
The relationship to buyers also effects negatively the sales volume. This result was to be expected, because the buyer relationship was defined as private jobs / total jobs. Nowadays in the construction trade the public orders includes great financial volume, so that firms with a greater number of public jobs are in a better position than firms with a greater number of private jobs.

The pricing policy (= executed jobs / tenders

received) has a positive influence on the dependent variable.

These three variables are the most important for the success of a strategy and are therefore the most important barriers between strategic groups.

Step 3.



The analysis of the strategic groups can be done incorporating firms which have similar values with respect to all significant strategy indicators in one group. In the study there are the following groups (without relation to sales):

GROUPS	FIRMS
A	1, 2, 4, 8, 11, 12, 13, 15, 16, 18,
B	5, 7, 17
C	3, 9, 14
D	10
E	6

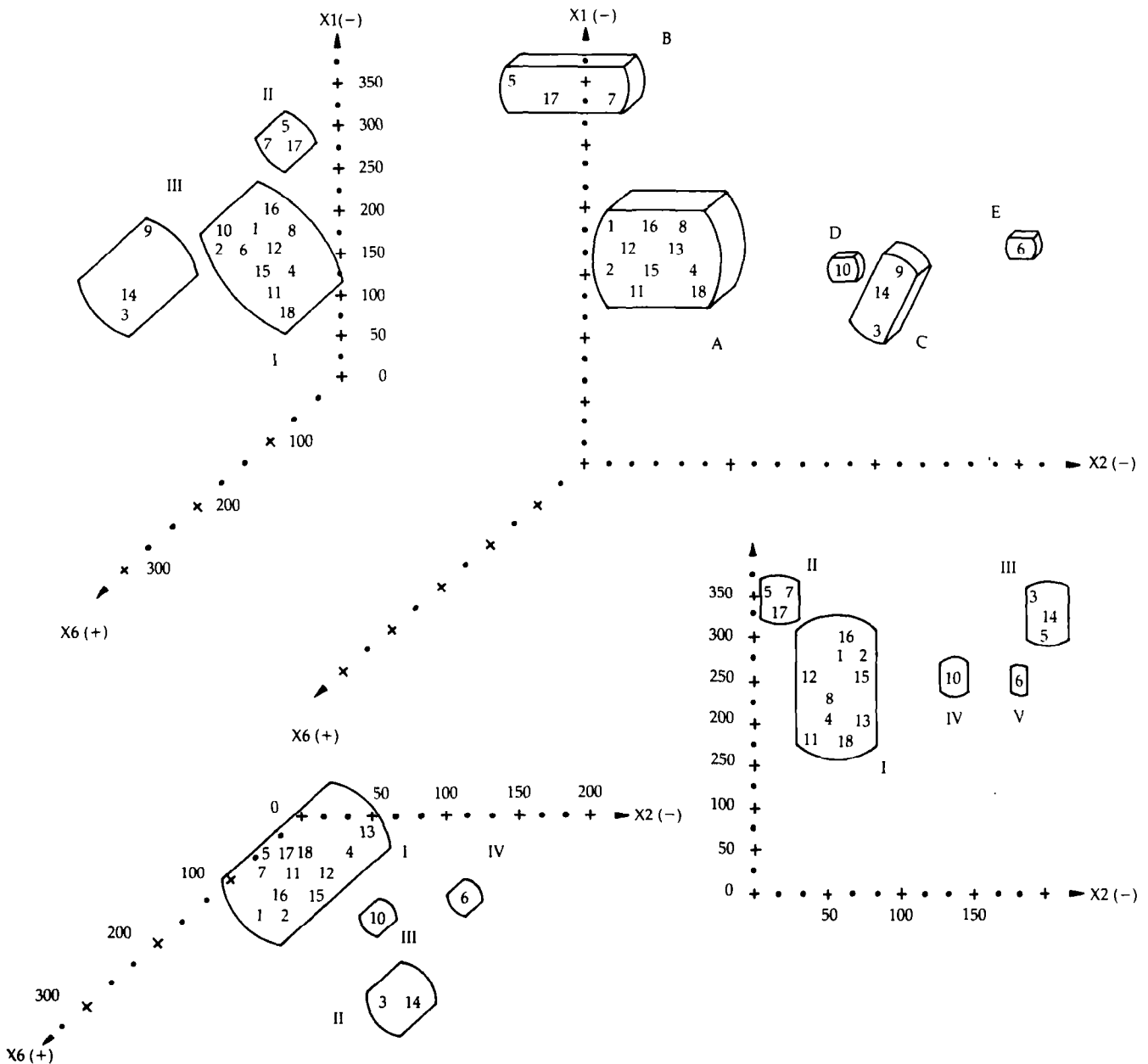
The more narrow the firms are with respect to one attribute (X1, X2 or X6), the more homogenous are they with respect to the attribute.

The smaller the field is, which a group takes, the more homogenous is the group with respect to two indicators. The smaller the space is, within which the firms of a group are, the more homogenous is the group with respect to all these determinants.

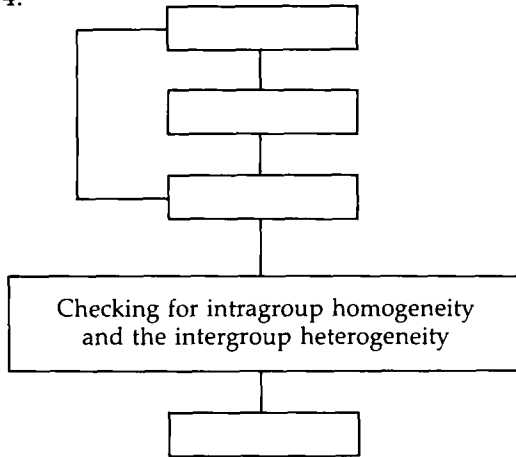
This is illustrated in Diagram 3

These groups can be shown in a graphical presentation (fig. 3).

Diagram 3: Graphical presentation of strategic groups in a three dimensional axial system



Step 4.



Checking of the homogeneity within a group with regard to all strategy-determinants can be done with the help of the correlation coefficient R^2 . The higher R^2 , the more homogenous is the strategic group. Group A has been analysed.

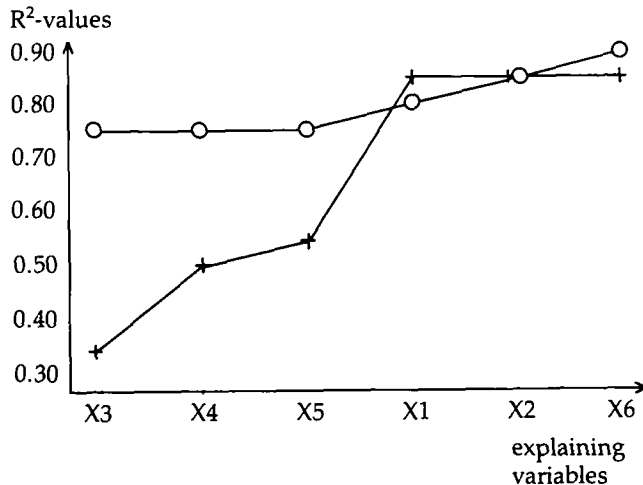
Checking the heterogeneity between the groups follows the same procedure as described above.

From each two firms were taken.

Diagram 3 shows that the firms in the strategic group A, which have been formed only with the variables X1, X2 and X6, are quite similar with respect to all six strategy-determinants. The R^2 -value gets higher at the X2 indicator, as shown in Diagram 4.

For the analysis of the intergroup heterogeneity the following firms are considered: 3, 5, 6, 7, 9, 10, 11 and 16.

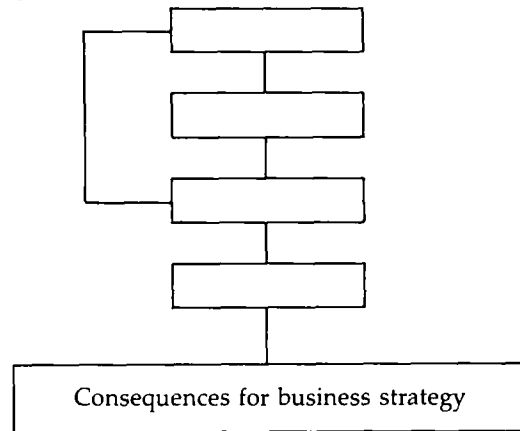
The Diagram 4 shows a strong variability curve, which indicates that there is no unitarity between the firms.



The second step made it possible to work out a priority order of the strategy determinants, with respect to their influence on sales. The construction firms in our study especially have to take into consideration pricing policy, the degree of specialization and the relationship to buyers in strategy formulation, because they are the principal influences on the success of that strategies.

The three most important strategy determinants are also the barriers between the individual groups. For example firms in Group A and Group B have a similar relationship to buyers and uniform pricing policy. The barrier between these two strategic groups is the great difference in the degree of specialization.

Step 5



If a firm from group B wants to get in group A, this firm has to concentrate its future strategy on the lowering of the degree of specialization and her investments must increase in this direction. The greatest differences between the strategic groups need not be the greatest barriers, because the firms of a strategic group react heavily to new competitors undermining the most important strategy determinants and defend themselves.

Diagram 3 makes it possible for each firm to see its position and those of the competitors. Therefore one's own strengths and weaknesses can be analysed in relation to the competitors.

Firms ahead on several strategy indicators can be demonstrated with respect to pricing policy, which is the most important for a successful strategy (strategic group C). Group B (II) is in an unfavourable position because specialization has a negative influence on sales.

Diagram 3 shows which groups are homogenous with respect to what determinants. Group A is most

homogenous with respect to the relationship to buyers.

Choosing and Defining the Indicators

Sales volume is not an optimal success indicator for a strategy. Cash-flow would be a better indicator in many cases.

A deep knowledge of the industry is necessary to define the strategy determinants. There are also problems regarding the correct definition of the indicators. For example, the technology includes only the construction machines. Very important equipment for the construction trade such as wireless sets or EDP have not been considered.

The explaining, independent variables are often not independent. Sometimes there is an intercorrelation between the strategy determinants.

We can only choose three indicators for determining strategic groups. Otherwise we should have to give up graphical presentation.

We can see the possible strategic movements of a firm in step five.

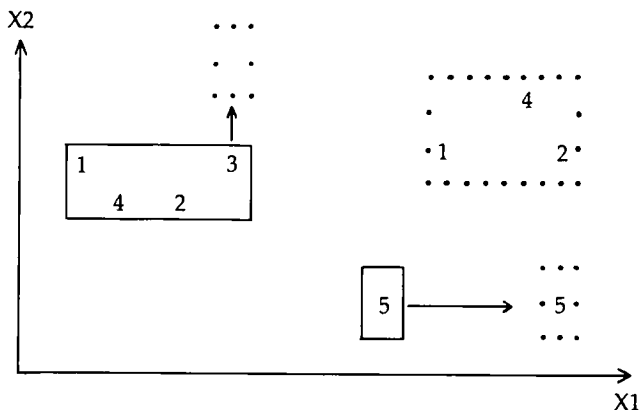
The consequences for strategic formulation are to consider one of three options.

- to establish a new, individual group.
- changing to a better group.
- consolidation of the position in the existing group.

So far the studies have been action shots, so that groups were analysed at a given time. To go to changes, we could work in the following way:

The strategic direction of a strategic group in the future can be shown by an arrow. Also the strategies of the individual groups are recognizable by such arrows. This is illustrated in Diagram 5.

Diagram 5: Graphical presentation of the strategic directions of strategic groups and firms

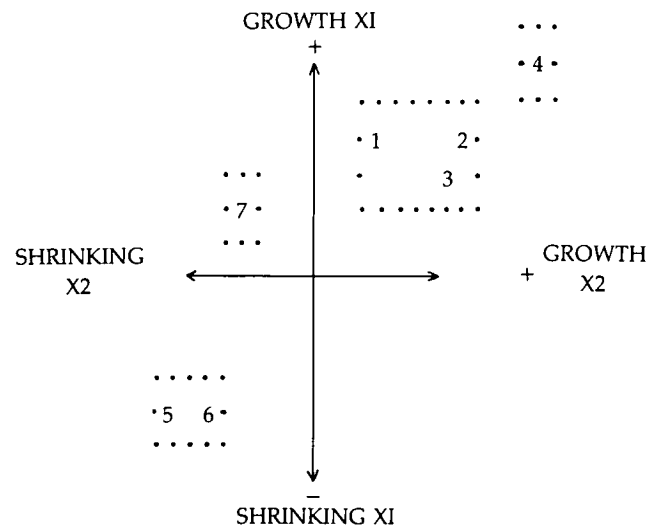


A challenging study in the future would be the timing of the strategy indicators. A rough idea of what would be needed is suggested by taking as the – dependent variable, Y, = the variation of cash-flow in a given period – independent, explaining variables, X, might be for degree of specialization for instance, the increase or reduction in the number of workers in a part of the construction trade compared with total workers of the firm in a given period.

Diagram 6 offers a graphical presentation of shrinking – or growth strategies with respect to two strategy indicators.

The groups can be formed with respect to similar growth or decline strategies of the firms.

Diagram 6: Comparison of Growth and Decline



References

1. Rhoades, Stephen, The Effect of Diversification on Industry Profit Performance in 241 Manufacturing Industries: 1963, in *Review of Economics and Statistics*, Volume 55, 1973.
2. Newman, Howard, Strategic Groups and the Structure-Performance Relationship, 1978.
3. Porter, Michael, "Industrial Organization and the Evolution of Concepts for Strategic Planning". *The New Learning*, in *Managerial and Decision Economics*, Vol 4 No 3, 1983.

Appendix: Multiple Regression Analysis

In research practice there are often problems which concern the influence of several independent, explaining variables on one dependent variable. Where characteristics are measurable on a quantita-

tive level and their influence on a dependent variable should be shown, the model of the multiple regression analysis is qualified for use. The aim of the multiple regression analysis is to determine the coefficient for each explaining variable which shows the influence strength in the context of the model.

The regression coefficients show the increase of the dependent variable Y when the independent explaining variable X_i is raised on unit and all other explaining variables stay constant. There is to be noticed, however that the extent of the regression coefficients are also influenced by the measuring unit.

Therefore a direct comparability is only possible when the coefficients are standardised.

The evaluation of the model with regard to the fixed values can be done with the multiple correlation coefficient R^2 . In multiple regression analysis the multi-collinearity represents a serious problem because the explaining variables can have a high correlation between each other. This has following effects, minor exactness in calculating the coefficients for the regression equation and explaining variables can be left out wrongly, because of high standard error estimation.

There are three alternatives of handling multi-collinearity. Either no consideration is given, elimination of the concerned explaining variables are eliminated, or the researcher transforms the amount of explaining variables to a new amount of variables, which consists of a combination of the original explaining variables.

The last method offers the possibility to include a new component in the regression analysis, instead of several original variables, between which exists a high intercorrelation.

The following steps have been adopted in our research.

Need for a high amount of variables in order to be able to make attendible forecasts; on the other hand including further explaining variables into the model increases their intercorrelation. The research has therefore to be directed forwards the combination of the variables into a little number of components, which contains as many information of the original variable amount as possible. For this reduction of the columns of the data material the factor analysis would be of use.

The influence of these components on the dependent variable Y should be analysed by the multiple regression analysis. So the influence strength of the components can be found.

With the most influencing components the objects should be combined to homogenous groups – whereby every line of the data material means one object (firm). The group structure is defined by the data themselves on the basis of the cluster analysis.

In this paper multiple regression analysis has been utilized in order to express the influence of the explaining variables ($X_1 \dots X_6$) on the dependent variable Y . The applicability of the cluster analysis is limited to the grouping of firms, without evidencing the priority of influence of the explaining variables.