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RELEVANT MARKET DELINEATION WITH
THE USE OF STRATEGIC BUSINESS
INFORMATION

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Abstract

In this paper an overview of methods used in antitrust analysis to delineate relevant markets is provided and shortcomings are pointed out. A practical methodology to delineate relevant geographical and product markets is developed, starting from the theoretical definition of a relevant antitrust market. Based on criteria used by business strategists in segmenting markets, the new methodology makes use of strategic information on the position of a company and its competitors in a specific industry sector to delineate relevant markets. The usefulness of the new methodology is illustrated for the European truck industry.

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INTRODUCTION

Relevant market definition is a tool to define the boundaries of competition between firms. The market definition makes it possible to calculate market shares and thus gives meaningful information about market power. This information serves for application in merger control regulations, competition policy, a.o. . However, in spite of its importance and in spite of good theoretical principles about market delineation, no straightforward practical methodology exists. The purpose of this paper is to develop a practical methodology, based on the use of strategic business information, that enables a better measurement of the relevant market, both in respect of the product and the geographic market.

The paper is structured as follows. Section 1 explains the problem of delineating the relevant market following the practice in antitrust cases dealing with mergers. Several existing techniques to delineate relevant antitrust markets will be summarised, as well as their shortcomings. Section 2 links the market delineation techniques from antitrust to the actual criteria used by business strategists to segment markets. This yields a new methodology for delineating relevant markets. The usefulness of this new methodology will be shown in section 3, where it will be applied for delineating the relevant geographical and product market in the truck industry.

HOW TO DEFINE THE RELEVANT MARKET?

A. <u>Conceptual framework</u>

For purposes of European Community law in the context of concentrations, the delineation of the relevant antitrust market is based on the abstract concept of the *hypothetical monopolist* (EC Communication 97/C 372/03, point 17). This approach focuses on the ability of companies to exercise monopoly power over a well-defined product and geographic space. A candidate market is called the relevant antitrust market if the hypothetical monopolist can profitably set a price in that market which is

significantly higher than the competitive price (in the range of 5% to 10%), without major loss of sales.

This condition can be translated based on the profit-maximisation condition for a monopoly. In this last condition the monopoly price p_c can deviate from the marginal costs MC as follows:

$$(p_c - MC)/p_c = 1/-e_{pc} \qquad \text{with } e_{pc} = \text{price elasticity of demand } (e_{pc} < 0).$$

After manipulation this equation becomes:

$$p_c/p = p_c/MC = e_{pc}/(e_{pc} + 1) \quad \text{with } p = \text{competitive price level.}$$

A method to delineate relevant antitrust markets can then be to include those products c in the relevant market if:

$$p_c/p = p_c/MC = e_{pc}/(e_{pc} + 1) > 1 + t$$

$$\text{with } t = \text{significant threshold (5\% to 10\%).}$$

However, accurate data on e_{pc} mostly lack and thus other less precise methods have to be used. Less abstract methods used in the economic literature to delineate relevant antitrust markets unfortunately all suffer from shortcomings. Many of these tests are actually based on the principle of an economic market rather than on the principle of a relevant antitrust market, which is a major drawback. An *economic market* is based on the principle of arbitrage, i.e. an economic market is that geographic and product market within which prices are linked to one another by supply- or demand-side arbitrage and prices in that market can be treated independently of other prices. A *relevant antitrust market* on the other hand is based on the principle of market power, i.e. on the ability of a firm to raise its price above the competitive price level. This entails that the delineation of the economic market can be completely different from the delineation of the relevant antitrust market.

In the next paragraphs both categories of methods will be discussed shortly and their shortcomings will be pointed out.

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B. <u>Methods based on the principle of market power</u>

Residual demand estimation

This first method is probably one of the best methods for market delineation, because it is one of the few methods which is most directly built on the definition of a relevant antitrust market instead of on the definition of an economic market. However, lack of reliable data and some methodological problems make it difficult to use the method in practice.

Method

Baker and Bresnahan (1985, 1988) and Scheffman and Spiller (1987) present a method which is directly meant to estimate the residual demand elasticity. More specifically, Baker and Bresnahan (1985, 1988) develop a product differentiated oligopoly model in which residual demands facing firms or groups of firms can be derived and estimated without estimating the Marshallian demand curves. Their analysis is intended to determine how market power possessed by the parties to a merger would be affected by an eventual merger. Additionally, Scheffman and Spiller (1987) consider the estimation of these residual demand curves for use in market delineation in a geographic context. The method of residual demand estimation is in priciple fairly simple. By using marginal costs as an instrument, an estimated residual demand elasticity is simply a measure of the extent to which cost shocks are passed through to prices. If cost shocks are largely passed through to price with relatively little effect on the quantity, then the residual demand is fairly inelastic. If cost shocks are not passed on or are passed on but quantity falls by a proportionately large amount, then the residual demand is fairly elastic.

Problems

There are several shortcomings to this method. Froeb and Werden (1991, 1992) indicate several limitations and problems associated with the residual demand approach, such as problems of extrapolation and problems dealing with nonstationarity. They also point out some problems that arise with the estimation procedure to be used. Finally, they notice that

the model only considers a static equilibrium and that the dynamic process is not taken into account.

One of the main disadvantages for practical use of this method is the high data requirement. Firm data are needed, and good instruments should be available. In addition to price and quality information, cost information is needed. The cost information must also vary between the different proposed markets. Whenever these data are not available, a different approach is needed.

Further, the method as it stands now, only takes the consequences of price changes into account. Consequences due to changes in other variables, such as advertising or other marketing instruments are not considered. Especially, in some sectors or industries this is a major drawback.

Demand elasticities

If data were sufficiently available, the residual demand estimation method would be ideal for relevant market delineation. But as already mentioned, in most cases the necessary data are not available. As an alternative, Sleuwaegen (1994) decomposes the residual demand elasticity into several different elasticities.

The elasticity of residual demand actually consists of two parts: first, the *partial demand elasticity*, which constitutes the most direct influence on the residual demand elasticity and second, the *competitive reaction elasticity*. Examining these different elasticities in detail also provides information about the size of the residual demand elasticity.

As also these elasticities are not readily available, the same reasoning can be used. Instead of directly estimating the different elasticities, different factors related to the elasticities could be examined, which could already lead to a rough estimate whether the residual demand elasticity in a specific situation is low or high.

The following elements influence the magnitude of the residual demand elasticity. First, the *partial demand elasticity* tends to be larger (which makes monopoly power lower) whenever:

1. There are more good substitutes available at competitive prices;

2. The good is less important for the consumer;

3. The good is more sensitive to purchasing power (income);

4. The breadth of the usability of the product is larger;

5. The product is less durable;

6. It takes less time for the consumer to react to price changes.

The second important elasticity is the *competitive reaction elasticity*. This elasticity is larger (which again makes monopoly power smaller) whenever:

1. The number of competitors increase;

2. Demand for the products is growing slowly;

3. Competitors are tempted to use price cuts or other competitive weapons to boost unit volume;

4. The products of competitors are not so strongly differentiated that buyers should incur high switching cost;

5. The size of the pay-off from a successful strategic move is larger;

6. It costs more to get out of a business than to stay in;

7. Firms differ more in terms of their strategies.

Further, competitive reactions and equilibrium responses for competing products crucially depend on the *supply elasticity* or the ease with which similar products can be supplied by other producers. A larger supply elasticity will of course form a larger competitive force and it will thus decrease the monopoly power. Two different situations can be distinguished: supply substitution from actual competitors, and supply substitution from potential competitors.

Regarding *actual supply conditions*, the supply elasticity is larger whenever:

1. The opportunity to buy from other suppliers is large;

2. The goods can be transported easily;

3. Switching costs are relatively low;

4. Transportation costs are relatively low.

The supply elasticity with respect to *potential supply conditions* is larger whenever:

1. Sunk costs are low;

2. Certain similar industries are in the position of overcapacity;

3. Government policies (like tariffs, quotas, and price controls) are not present;
4. Barriers to entries created by the distribution system are low;
5. The amount of R&D investments, the length of the development period, patents, etc. do not limit new entrants that much;
6. Economies of scale are low
7. There is no risk of strong retaliation if a new firm enters;
8. Market demand is growing.

Evaluation

Investigating all these different influences on the residual demand elasticity may provide a better understanding of the different disciplinary forces and therefore on the market power of a specific firm or a group of firms. However, since it is difficult to estimate the size of all these effects, it is not possible to delineate the relevant antitrust market exactly by use of this method. It may however provide enough information in a specific situation to decide whether a firm or a group of firms does not have enough market power to control a market. In order to determine the exact size of the relevant antitrust market however, more detailed estimates are needed.

C. Methods based on the principle of arbitrage

Whereas the first two methods follow closely the definition of a relevant antitrust market, they are both very difficult to use in practice, due to a lack of adequate information. Therefore, many methods have been developed based on the definition of an economic market. These alternative methods focus on one or more factors related to the partial demand elasticity and the competitive reaction elasticity and thus give only a partial indication of market power. In the next section the most important methods will be reviewed.

Price tests

In this section several price tests which are used in the literature to delineate the relevant antitrust market will be briefly reviewed. The idea behind all these tests is that prices of two goods that belong to the same market should move together. These tests are thus based on the definition of an economic market instead of on the definition of a relevant market. Although the method has been criticised because of the use of the wrong market definition, these price tests might be a good indicator for the partial demand elasticity.

Many scholars (e.g. Kottke (1960), Areeda and Turner (1978), Stigler and Sherwin (1985)) advocate the use of **price correlations** to delineate antitrust markets. Stigler and Sherwin (1985) even argue that price correlations should be *the* test for delineating antitrust markets. According to them, the similarity of price movements captures the essential role of competition in dominating the price movements within each part of the market. Whenever closely parallel price movements are found between various places, the products should be placed in the same market. Similarly, whenever significant nonparallel price movements are found, the products are not in the same market.

However, as Stigler and Sherwin (1985) state, there exists no unique criterion for determining whether a correlation is large enough to place one product or area in the relevant market delineated for the other.

Moreover, Werden and Froeb (1993) indicate that the use of price correlations to delineate antitrust markets is incorrect and involves many problems. Their most fundamental problem is that products which must be placed in the same market, because they are close substitutes, do not necessarily have prices that are highly correlated.

In a similar vein Bishop and Walker (1996) address the issue of price correlation in the presence of different exchange rates between the markets to make the approach applicable to the European situation. Their conclusion is that, "except where exchange rates are very stable and so approximate to fixed exchange rates, price correlation should not be used for market definition across exchange rate areas" (p. 1).

Another remark by Bishop and Walker (1996) regarding price correlation tests deals with stationarity. They argue that to avoid spurious correlation, it is very important to use price correlation analysis only after price series have been made stationary.

A second price test is the **price equality test** (see e.g. Shrieves (1978) and Horowitz (1981)). This test is based on the proposition that if two geographic areas should be considered a single market, then the price at which the product sells in the two areas cannot be different. A closely related test to this would be to use normalised prices to correct for differences in the products (see e.g. Spiller and Huang (1986)). However, Werden and Froeb (1993) remark that the fact that the prices of two products or areas differ significantly is neither a necessary nor a sufficient condition for either product or area to be in or not to be in the relevant market delineated for the other.

A third price test is the **speed of adjustment test** (see e.g. Mathis, Harris and Boehlje (1978), who discuss relative speeds of adjustment, and Horowitz (1981), who discusses absolute speed of adjustment). This type of tests considers the adjustment process through which the difference between any pair of prices would converge to its equilibrium level. If the speed of adjustment parameter is close to zero, then there is fast convergence to the equilibrium.

However, also this test has many shortcomings and problems, as is pointed out by Werden and Froeb (1993) and Uri, Howell and Rifkin (1985). Werden and Froeb (1993) even suggest that the use of relative speeds of adjustment is incorrect. They argue that it is irrelevant that the price of a substitute responds to shocks in the candidate market more slowly than do prices of products in the candidate market if both respond very quickly.

Starting in 1985, tests for antitrust market delineation were developed that made use of modern time series methods, such as **Granger causality**[3], **exogeneity**[4] and **measures of**

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[3] Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term. Klein, Rifkin, and Uri (1985, p. 111) describes Granger causality as follows: "A time series X_t 'causes' another time series Y_t, in the sense defined by Granger if the present Y can be predicted better by using past values of X than by not doing so".

[4] Slade (1986, p. 294) explains that this test "seeks to determine whether price movements in one regions have repercussions in another; that is, is seeks to establish if price determination in one

feedback (see e.g. Klein, Rifkin and Uri (1985), Uri and Rifkin (1985), Uri, Howell and Rifkin (1985), Cartwright, Kamerschen and Huang (1989), Slade (1986)). These methods are actually refinements of the test proposed by Horowitz (1981).

However, Werden and Froeb (1993) show that the problems with using measures of feedback to delineate relevant markets are essentially the same as those with using price correlation, while the other two tests are subject to much the same criticism as the speed of adjustment tests.

Cointegrated series[5] can be described by models, known as error correcting, that allow long-run components of variables to obey equilibrium constraints while short-run components have a flexible dynamic structure (see Engle and Granger (1987)). Whalen (1990) argues that if two geographic locations comprise a single geographic market, their price series should be found to be cointegrated.

However, cointegration is not a sensible test for relevant market delineation when series do not have unit roots, as is often the case (Werden and Froeb (1993)).

Evaluation

The key criticism against all these tests is that the notion of supply substitution is not taken into account. Next to demand substitution, supply substitution can be a competitive restraint which prevents a firm from raising its prices. Therefore, a careful analysis of the industry should be added in order to minimise possible errors in using price test. In spite of all the limitations, price tests can yield valuable information. As Bishop and Walker (1996) argue, "given its relatively low information requirements and ease of use, it would be foolish to ignore a technique that is potentially information bearing" (p. 1), and "an understanding of the potential weaknesses and pitfalls in the use of price correlation analysis should allow the investigator to maximise the usefulness of the procedure" (p. 17).

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market is exogenous to price formation in another and vice versa".

[5] A group of non-stationary time series is cointegrated if there is a linear combination of them that is stationary; that is, the combination does not have a stochastic trend. As an example, consumption and income are likely to be cointegrated.

Shipment data

Similar to the price tests, also the shipment data method tries to give a good alternative indication of the partial demand elasticity. Elzinga and Hogarty (1973, 1978) present a method that is only applicable in delineating geographic markets. They argue that the presence of shipments between two geographic areas is an indication of the fact that the areas should actually be regarded as one single market. The method is constructed by the application of two tests: the LOFI ("Little Out From Inside") and the LIFO ("Little In From Outside") test. The LOFI test concerns the supply side and poses the question: 'What is the smallest geographic region required to account for nearly all shipments from a given producing area?'. The LIFO test deals with the demand side and poses the question: 'Of total purchases within the region identified by the LOFI test, do nearly all emanate from within that region itself?'. If both 75% (or alternatively 90%) of the consumption of a product is produced within a specific area, and 75% (or 90%) of the production within this area is consumed within this area, then a distinct geographic market has been identified.[6]

Evaluation

Werden (1981) criticises the approach of Elzinga and Hogarty (and also the method suggested by Shrieves (1978)). In his paper he identifies two important situations in which the proposed test will produce erroneous results. On the one hand the method fails to identify the concept of cross-price elasticities of demand, on the other hand the method cannot evaluate the hypothetical reactions after a possible merger. Also Stigler and Sherwin (1985) have some reservations about the method.

Nevertheless, the pattern of shipments can certainly provide information about the size of the geographic relevant market. In line with the arguments of Elzinga and Hogarty (1973,1978), it is essential to take both the LIFO test and the LOFI test into consideration. After all, there can be disciplinary forces from both the demand side and the supply side.

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[6] Shrieves (1978) extends the test developed by Elzinga and Hogarty by including price data.

However, in case of a relatively large product differentiation, this could imply that the disciplinary forces on the prices could be too small. Further, one should be very careful in making the opposite statement. It may well be the case that, although there is no (or very little) movement of goods between regions or countries, the outside region does constitute a disciplinary force on the inside region, especially in situations where products are rather homogeneous.

Diversion ratio

Shapiro (1995) defines the diversion ratio as the fraction of sales lost by firm A to competitor B due to a price increase by firm A. Whenever econometric estimation of elasticities is not possible due to lack of sufficient good data, there still may be relevant consumer survey data that can be used to directly estimate the diversion ratio (Shapiro, 1995).

The diversion ratio is closely related to the cross-elasticity of demand. Willig (1991) notes that the ratio of the cross-price elasticity to the own price elasticity measures the share of the marginal sales of one brand that will divert to another in response to a price increase.

C. Conclusion

All the above mentioned tests have many shortcomings or the methods based on the principle of arbitrage can give only a partial view on the relevant market, no method is comprehensive. However, although none of the alternative methods provides the optimal solution, most methods give some insight on the size and scope of the relevant antitrust market. In accordance with Bolton (1998), who argues in favour of building up various kinds of evidence to get a clear picture, building up evidence combining several methods could then lead to a substantial knowledge of the exact size and scope of the relevant antitrust market.

MARKET DELINEATION TECHNIQUES USED BY BUSINESS STRATEGISTS

The previous methods discussed so far follow directly from basic economic theory. In applying these methods, practitioners often overlook the information that can be obtained from the deployed strategies of firms. As is argued hereafter, the business strategists use interesting techniques that may yield interesting indications of relevant anti-trust markets. Business strategy techniques are concentrated around the competitors' reactions and can give a good alternative for the direct estimation of both partial demand elasticity and the competitive reaction elasticity as will be shown in the next sections.

One of the primary tasks managers face in formulating competitive strategy consists of defining the business, including the relevant arena of competition: What businesses are we in? Where are we competing? Who are our competitors? This approach provides a useful source of information for identification of the relevant market.

A. Conceptual approach

When trying to define a business, two possible perspectives emerge (Day (1997)): either in terms of its served market (*demand-side definition*) or in terms of the products or services of which it is comprised (*supply-side definition*). Within both perspectives patterns of substitution can be examined. Substitution can be viewed from a demand-side perspective to account for all the ways customers can satisfy their needs, or a supply-side perspective to include all the competitors with the capabilities to serve these customers. These two perspectives are closely intertwined and should be integrated when defining a business.

But although integration of both supply- and demand-side perspective is promoted, in many studies emphasis is placed on only one perspective. In the next paragraphs the supply- and demand-side view will be discussed separately. In a later stage both perspectives will be integrated into one framework.

B. Product-oriented supply perspective

The supply-side approach starts with the group of competitors who could possibly serve the needs of a group of customers. It explicitly considers technological similarity, relative production costs and distribution coverage.

This supply-side perspective addresses the following questions (Day (1990)):

- Which competitors are serving related product classes with the same technology, manufacturing processes, material sources sales force and distribution channels?
- What is the geographic scope of the market? Is it regional, national or global?
- Which competitors should be included – only those presently serving the market or potential entrants with a capacity to compete?

These questions are vital to an understanding of the relative cost standing of a business, and degree of transferability of experience into related arenas.

To draw the boundaries of the competitive arena, the supply-side approach looks for significant discontinuities in the patterns of costs, capital requirements and margins along the product and customer dimensions. These discontinuities create barriers that insulate prices and profits within a product market from the activities of competitors outside the market. They also discourage easy entry by potential competitors. When boundaries are properly defined, the relative profitability of competitors within a market can meaningfully be compared.

The criteria used in this supply-side perspective form the basis of the Standard Industrial Classification (SIC) or European NACE system and have generally wide acceptance because they appear easy to implement. They lead to seemingly stable and clear-cut definitions, and importantly, involve factors largely controllable by the firm; implying that the definition is somehow controllable as well. They are also helpful in identifying potential competitors, because of similarities in manufacturing and distribution systems.

Nevertheless, this approach has been criticised to be arbitrary and based exclusively on managerial judgement and intuition (Curran and Goodfellow (1989)). Especially

marketing-planners argue that this approach seldom gives a satisfactory picture of either the threats or the opportunities facing a business. Therefore, considerable attention has been directed toward defining product-markets from the customers' perspective.

C. Customer-oriented demand perspective

In the customer-oriented approach, customer needs and requirements are at the forefront. This approach is mainly based on two assumptions. First, it is assumed that individuals seek the benefits that products provide, rather than the products per se. Secondly, consumers consider the available alternatives from the vantage point of the usage contexts with which they have experience or the specific applications they are considering; it is the usage requirement which dictates the benefits being sought.
On the basis of these two premises a product-market is defined as follows:

> 'the set of products judged to be substitutes, within those usage situations in which similar patterns of benefits are sought, and the customers for whom such usages are relevant' (Day, Shocker and Srivastava (1979), p.10).

From this definition, substitutability implies that the purpose or application, rather than the product features as such, becomes the organising theme for considering alternatives. This means that this approach encompasses more than just *substitutes-in-kind*, it also includes *substitutes-in-use*[7].

Analytical methods for customer-oriented product-market definitions:
Customer-oriented methods for identifying product-markets can be classified by behavioural or judgmental data.

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[7] Substitutes-in-kind: all the products that look alike and represent the same application of a distinct technology to the provision of a distinct set of customer functions.
Substitutes-in-use: the products serve the same functions, but may do this in a very different way.

Behavioural methods are based on inference of actual substitutability from buyer behaviour (Day, Shocker and Srivastava (1979)). It provides a good indication of what people actually do, but not necessarily what they might do under changed circumstances. Behavioural techniques are particularly suited for the study of established and relatively stable markets and are of value for predictive purposes only so long as data on prevailing market conditions are available (e.g. pricing structures, promotional expenditures and effectiveness, product availability,...). Well-known behavioural methods are cross-elasticity of demand, similarities in behaviour and brand switching (Day, Shocker and Srivastava (1979)). Unfortunately, the lack of suitable data often puts a heavy restriction on the application of the behavioural techniques. Therefore, we will not go into more details about these different methods in this study.

In the *judgmental methods* data are primary collected following the buyer's perceptions of substitutability between products and it constructs market structures accordingly. The methods are built on the fact that customers often have considerable knowledge of existing brands through personal or friends' experiences and exposure to promotion. Their perceptions may not always correspond to what manufacturers may believe about their own or competitive products.

In the short term, judgemental techniques probably offer the most potential and this is reflected by the emergence and development of new techniques during the last ten years. Day, Shocker and Srivastava (1979) analyse four analytical approaches within the judgemental methods: decision sequence analysis, perceptual mapping, technology substitution analysis and customer judgments of substitutability.

1. Decision sequence analysis

The decision sequence analysis utilises 'protocols' of consumer decision making, which indicate the sequence in which various criteria are employed to reach a final choice (Bettman (1971), Haines (1974)). Based on similar decision procedures, individuals can be grouped into segments.

Although this method has its benefits, such as giving a better insight into the hierarchy of product types and understanding the patterns of competition, it also has some major drawbacks. First, the typical representations of decision sequences appear quite

complex and pose serious difficulties for aggregation of the individual models into a small number of meaningful segments. Further, since it is generally expensive to develop protocols, a representative sample of customers may be unrealisable.

2. *Perceptual mapping*

Perceptual mapping includes a large family of techniques used to create a geometric representation of customer's perceptions of the qualities possessed by products/brands comprising a previously defined product-market (Green (1975)). Those techniques include direct scaling, factor analysis, multiple discriminant analysis a.o.

Unfortunately, such diversity of criteria and method can lead to somewhat different perceptual maps and possibly different product-market definitions. More empirical research is still needed to compare the alternatives and assess which produce definitions are more valid for particular purposes (Shocker and Srinivasan (1979)).

3. *Technology substitution analysis*

This method adapts the idea of preference related to distance in a multi-attribute space to the problem of forecasting the substitution of one material, process or product for another. Each successful substitution tends to follow an S-shaped or 'logistic' curve representing a slow start as initial problems and resistance to change have to be overcome, followed by more rapid progress as acceptance is gained and applications can be publicised, and finally a slowing in the pace of substitution as saturation is reached. A simple approach to forecasting the course and speed of the substitution process is to project a function having the appropriate logistics curve, using historical data to determine its parameters (Lenz and Lanford (1972)).

Although criticism can be raised with respect to the model structure, the approach gives a highly useful quantitative measure of utility, which can be used to estimate substitutability among competing products or technologies in specific usage-situations.

4. *Customer judgments of substitutability*

Customer judgments of substitutability can be obtained simply by asking a sample of customers to indicate the degree of substitutability between all possible pairs of

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products or brands on a rating scale. The results of such analyses are seldom useful, however, for customers lack a specific context within which to make their judgments. For this reason, *substitution-in-use* techniques have been developed that give good insights into product-market boundaries. Customers are asked to judge the appropriateness or acceptability of a number of potentially competitive products for specific conditions of use. A market can then be defined as a set of products that are judged to be appropriate within usage situations in which similar patterns of benefits are sought.

D. Market definition: an integrative approach

To avoid myopic market definitions, an integrative analysis should adopt both the supply- and demand-side perspective, as there are inherent deficiencies to each approach. Otherwise, shifts in customer requirements and needs that may create new segments will be overlooked, and competitive threats from different technologies which can serve the same functions or satisfy similar needs will not be appreciated. In the same sense should the customer perspective not overwhelm the economic realities which dictate the ability to compete profitably. Perceptions of opportunities may be distorted where the competencies and experience base of the company can be effectively employed. Levitt (1975) drew attention on this danger for 'marketing myopia' when he noticed that "railroads let others take customers away from them because they assumed themselves to be in the railroad business rather than in the transportation business. (...) They were product-oriented instead of customer-oriented."

1. Scope and differentiation

To get a global and complete definition of a business, it is necessary to define the business in terms of its 'product-market' strategy, rather than in terms of either products or served markets alone. Abell (1980) describes products and served markets following a three-dimensional conceptualisation: the customer group dimension, or WHO is being served, which may be classified in a number of different ways, e.g. demographics, user industry, buyer behaviour,...; secondly, the customer function

dimension, or WHAT NEED is being satisfied; and finally the technological dimension, or HOW customer functions are being satisfied. The final dimension is felt necessary as it is often possible to satisfy a need group using different technologies. All three dimensions play an important role in the business definition.

In order to define an organisation's activity along the three dimensions discussed by Abell, the concepts of scope and differentiation are used. Scope defines the level of activity along each of the three dimensions whilst differentiation defines how an organisation participates along each of the three dimensions, and in particular the degree of variation in its marketing strategy. In an earlier work, Abell (1979) also uses the concept of segmentation alongside scope and differentiation.

Using these concepts, Abell abandons traditional 'demand-side' and 'supply-side' criteria for defining market boundaries and distinguishes between markets, businesses and industries as follows:

- A *business* is defined by a selection of customer groups and functions and is normally based on one primary technology.
- An *industry* is defined by the boundaries of several businesses but is still usually based on a single technology.
- A *market* is defined by the performance of given functions in given customer groups, and includes all the substitute technologies to perform those functions.

Together with Abell, many other studies point out this need for an integrated approach (Day (1981), Abell and Hammond (1979)), but only few studies come to the actual elaboration of an integrated framework. Taking a closer look at revealed business strategies and the competitive landscape, useful information can emerge about the relevant market.

2. *Relevant competitors and relative market shares*

An interesting perspective in the integrative approach has been given by Brooks (1995). He argues that the relevant market for a firm can be identified through the use of information on the firm's competitors. A competitor then is a firm that not only produces similar goods, but also targets the same customers. This last condition is

crucial to make both firms competitors: if they would not target the same customers, they would not have anything to compete over.

The same reasoning can be found in Koch (1995) when he develops a methodology that is based on a firm's relevant (actual and potential) competitors, rather than it's relevant market, when determining a firm's business segments. He assumes that if competitors are the same in potential segments and their market shares are about the same, then both segments are probably actually one. Based on these principles, he suggests two very simple and practical 'segmentation tests', which can be applied to a list of possible business segments.

The first test is a very short test that provides a good first indication. It is based on two questions:

(1) Are competitors in the two potential business segments different or the same? If the answer is 'different', then they are probably separate segments, and there is need to answer question 2

(2) If the answer to question 1 is 'the same', do the competitors (including yourself) have roughly similar market share positions in the two potential business segments, i.e. if competitor A is the leader in one potential segment, followed by B, followed by C, is this the same ranking in the other potential segment? If so, the two areas are probably one single segment; if not, they are probably separate segments.

The second test is longer and more formal (see table I). It contains 12 questions to which a YES/NO answer has to be given. When adding the scores of the different questions together, the result can be either positive or negative. If the result is positive, the two products or areas should be treated as separate segments. If the result is negative, both products or areas are currently the same. The further away from zero the answer is, the more certain is the result.

Table I: segmentation test

		Column A Score	Column B Score
1	Are the competitors in the two products or areas the same?		
	YES: Column A / NO: Column B	-30	+30
2	Are the Relative Market Shares (RMS) of the firm and the leading competitors roughly the same in the two products or areas?		
	RMS similar: Column A / RMS different: Column B	-50	+50
3	Are the customers the same in the two products or areas?		
	YES: Column A / NO: Column B	-20	+20
4	Are the customers' main purchase criteria and their order of importance roughly the same in the two products or areas?		
	YES: Column A / NO: Column B	-30	+30
5	Are the two products substitutes for each other?		
	YES: Column A / NO: Column B	-10	+10
6	Are the prices of the two products (for equivalent quality) or in the same areas roughly the same?		
	YES: Column A / NO: Column B	-20	+20
7	Is the firm's profitability roughly the same in the two products or areas?		
	YES: Column A / NO: Column B	-40	+40
8	Do the two products or areas have approximately the case need for capital per dollar of sales, i.e. similar capital intensity?		
	YES: Column A / NO: Column B	-10	+10
9	Are the cost structures in the two products or areas similar (i.e. roughly the case proportion of cost in raw materials, manufacturing, marketing, selling,...)?		
	YES: Column A / NO: Column B	-10	+10
10	Do the products or areas share at least half of their costs (the use of common labour, machines, premises and management resources for at least half of their total costs)?		
	YES: Column A / NO: Column B	-30	+30
11	Are there logistical, practical or technological barriers between the two products or areas that only some competitors can surmount?		
	NO: Column A / YES: Column B	-20	+20
12	Is it possible to gain an economical advantage by specialising in one of the products/areas by gaining lower costs or higher prices in that product/area as a result of focussing on it?		
	NO: Column A / YES: Column B	-30	+30

3. Strategic group mapping

Since the formulation of a competitive strategy starts with defining the relevant market, the implemented strategy of a firm may in a recursive way provide a good definition of the relevant market on which a firm concentrates. One may for instance infer the extent of globalisation of the market through analysis of the global strategy of a firm. To evaluate whether firms actually have a global strategy, Yip (1995) formulates five dimensions, the *global strategy levers*. As a first indicator he mentions market participation. When firms are really global players, they are active in many countries worldwide on a significant base, i.e. they posses a significant more or less equivalent market share in several countries. This in contrast to a traditional multinational firm, where market shares can differ between the countries in which it operates. Secondly, a global player will offer the same products worldwide. Here not only completely standardised products are meant, but also related products from a market-based view or a technological view (i.e. related diversification). In the same sense, as a third indicator, a standardised marketing where the same brand names, advertising, etc. are used, also points to a possible global strategy. A fourth indicator for a firm to have a global strategy, is the location of value-adding activities. Whereas a traditional multinational duplicates many value-adding activities, a truly global firm locates each individual activity in only that country most appropriate for that activity. As a last element, Yip formulates the competitive moves of a firm. In a global strategy, competitive moves have to be integrated across countries rather than making distinct moves by country. Integrated competitive moves also affect all the previous global strategy levers of global market participation, global products, global marketing and global activity location, typically needing to be used in conjunction with one or more of them. When several of the indicators point in the direction of a global strategy, from an anti-trust point of view it can be said that the world is the relevant anti-trust market. If the levers all apply to a region in the world, i.e. the EU, the firm has a regionally differentiated strategy, comprising for instance the EU as a relevant market.

A more general technique for getting an indication about the relevant market when analysing a firm's strategic behaviour is *strategic group mapping* (Porter (1980)). The formation of strategic groups is based on the boundaries drawn by both customers and

competitors, as well as the history and capabilities of the firm and competitors (Day (1997)). Within such strategic groups, firms look alike in their scope of activities and market coverage, follow similar strategies,... . Moves by the firms in the same group will be quickly countered, while initiatives from within other groups do not call for a reaction. An industry may contain only one strategic group when all sellers approach the market with essentially identical strategies or, at the other extreme, there may be as many strategic groups as there are competitors when each rival pursues a distinctively different market approach.

A strategic group map is constructed by plotting the market positions of the industry's strategic groups on a two-dimensional map using two strategic variables as axes. Porter (1980) indicates five important guidelines for constructing a strategic group map, which he summarised as follows:

- Identify the broad characteristics that differentiate firms in the industry from one another;
- Plot the firms on a two-variable map using pairs of these differentiating characteristics;
- Assign firms that fall in about the same strategy space to the same strategic group;
- Draw circles around each strategic group, making the circles proportional to the size of the group's respective share of total industry sales revenues.

As Day (1997) pointed out, one should note that strategic groups are not fixed over time. They are in constant evolution and it is important to have a well-reasoned point of view on how they are likely to change.

Also Boardman and Vining (1996) use strategic groups as the best synthesis between both approaches. In their study an explicit framework has been developed to come to strategic groups starting from firm specific product-customer matrices. Figure 1 gives a schematic overview of the different steps in determining strategic groups.
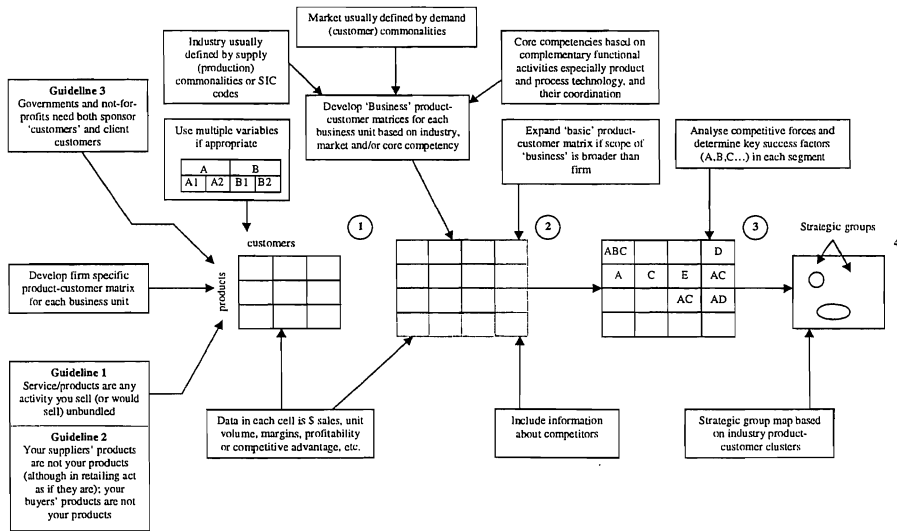
Market usually defined by demand (customer) commonalities

Industry usually defined by supply (production) commonalities or SIC codes

Core competencies based on complementary functional activities especially product and process technology, and their coordination

Guideline 3
Governments and not-for-profits need both sponsor 'customers' and client customers

Use multiple variables if appropriate

A		B	
A1	A2	B1	B2

Develop 'Business' product-customer matrices for each business unit based on industry, market and/or core competency

Expand 'basic' product-customer matrix if scope of 'business' is broader than firm

Analyse competitive forces and determine key success factors (A,B,C...) in each segment

Develop firm specific product-customer matrix for each business unit

① customers

products

②

③

Strategic groups 4

ABC			D
A	C	E	AC
		AC	AD

Guideline 1
Service/products are any activity you sell (or would sell) unbundled

Guideline 2
Your suppliers' products are not your products (although in retailing act as if they are); your buyers' products are not your products

Data in each cell is $ sales, unit volume, margins, profitability or competitive advantage, etc.

Include information about competitors

Strategic group map based on industry product-customer clusters

Figure 1: Strategic group mapping based on product-customer clusters

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THE RELATIONSHIP BETWEEN THE BUSINESS PERSPECTIVE AND ANTITRUST ANALYSIS

It is interesting at this point to relate the different methods used within strategic business perspective to the concept of the residual demand elasticity, used in antitrust analysis.
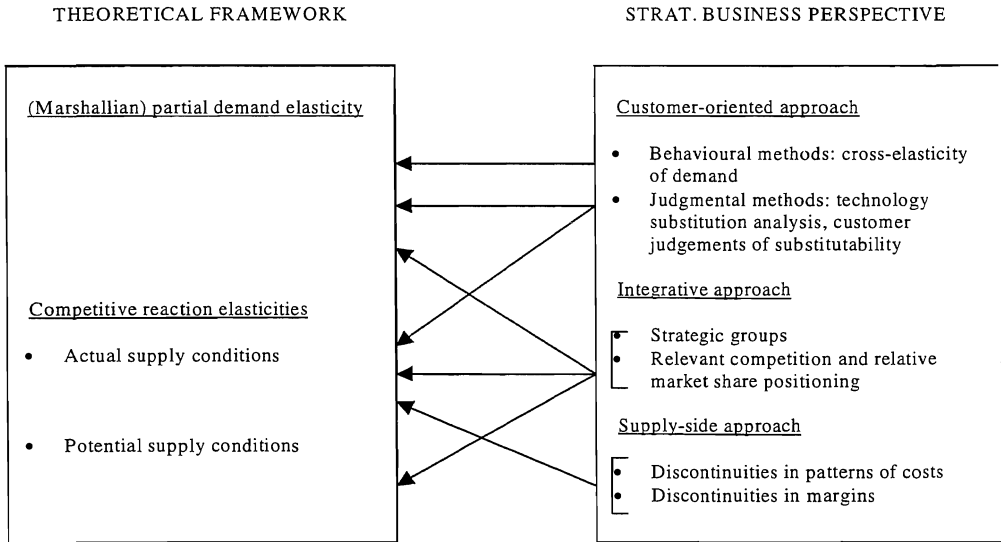
The figure above shows how the different approaches that exist in the strategic management literature can be matched with one or more of the different components from the residual demand approach.

In the customer-oriented approach two groups of methods emerge: the behavioural methods and the judgmental methods.

From a behavioural perspective, especially the cross-elasticity of demand could be a useful measure for demand substitution. The measure can accurately identify a product's substitutes and thus be linked easily to the Marshallian partial demand

elasticity. Unfortunately, practical use of this measure gives rise to several problems (Sleuwaegen (1994)).

The second group of judgmental methods (Day, Shocker and Srivastava (1979)) contains analytical methodologies that can be linked to the partial demand elasticity as well as to the competitive reaction elasticity. Customer judgements of substitutability can give an interesting insight in the demand-side substitution of a product. On the other hand, technology substitution analyses are used to shed a light on what material, process or product could be substituted by another material, process or product. Therefore, they can be used to estimate substitutability among competing products or technologies and thus give an indication on actual supply conditions.

From the supply-side approach methodologies such as discontinuities in patterns of costs or margins can be used to divide different products into segments. These methodologies can point out where the actual competitors are situated and thus give an indication about competitive reactions.

The integrative approach tries to combine both previous approaches. The determination of strategic groups (Porter (1980), Boardman and Vining (1996)) as well as the methodology based on the relative market shares and competitors, suggested by Koch (1995), contain elements that are related to all the different components of the residual demand elasticity. Both analyses try to find indications of both partial demand elasticities and competitive reaction elasticities.

The two methods from the integrative approach will be illustrated in the next paragraph, where both methods will be combined to identify the relevant market in the truck industry in terms of product and geographical space.

APPLICATION: THE TRUCK INDUSTRY

A description of the situation and developments of the European truck industry in the late 80's may serve to illustrate the use of strategic group mapping and market share and competitors analysis in determining the relevant market.

The European truck industry, anno 1989

In 1989 seven major producers were active in the truck industry in Western Europe. This industry usually was segmented according to Gross Vehicle Weight (GVW) into three segments: light GVW (>3.5T-4.9T), medium GVW (5T-16T), heavy GVW (>16T). The manufacturers could differ significantly in segment scope.

Most players were active in several European countries, although also here differences emerged between those seven producers.

Overall, in 1988 the West-European manufacturers produced 1.250.000 vans and 400.000 trucks. Of the vans 12% was destined for exports. The rest covered 80% of the West-European demand. The remaining 20% were imported. The heavy truck sector had almost no imports (2%), but quite significant exports (22%).

The relevant market

The research question in this application is whether in the late 80's one could speak of one market for trucks, independent of GVW segments, and of a Single European Market as the relevant market for the truck industry.

1. Relevant competitors and relative market share positioning

When considering the segments light weight trucks (<6T) and heavy weight trucks (>6T), it can be seen from figure 2 that very different players dominate both segments. This indication points out that both light and heavy weight trucks should be considered as separate groups for relevant market delineation purposes.
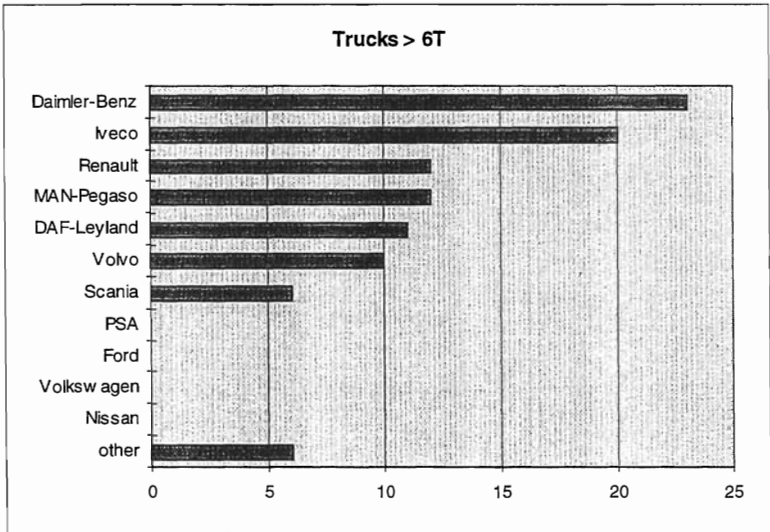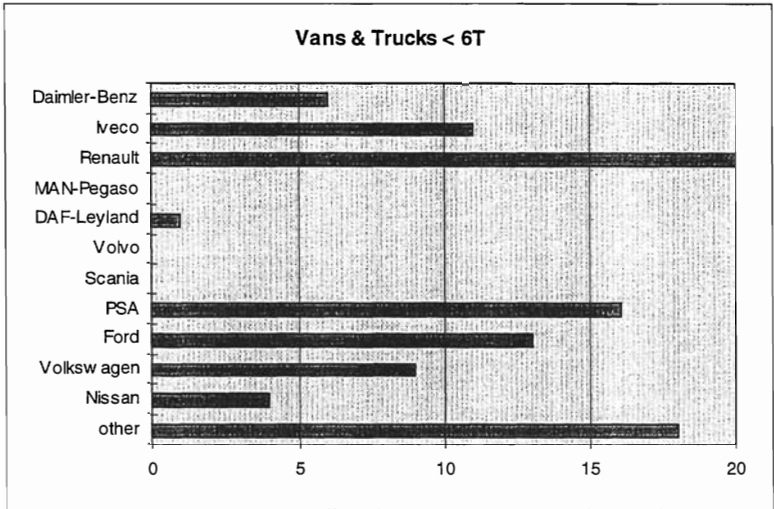
Vans & Trucks < 6T

Trucks > 6T

Figure 2: Market share of European new truck unit sales by manufacturer and by segment, 1989 data

In he same line, also for delineating the relevant geographical market, market share data for the different truck makers can give a clear indication. For 1989 data on market shares are available for the UK, France, Italy, West Germany and the Netherlands (see figure 3).
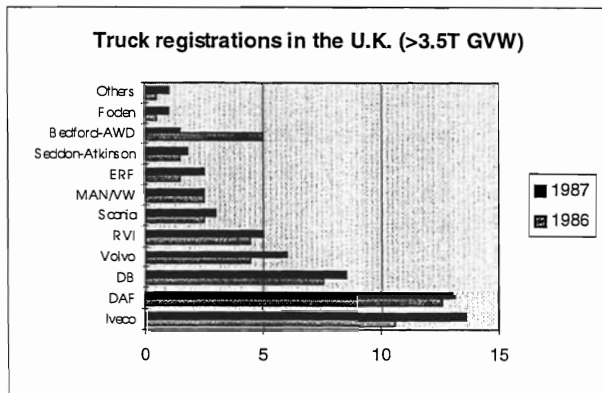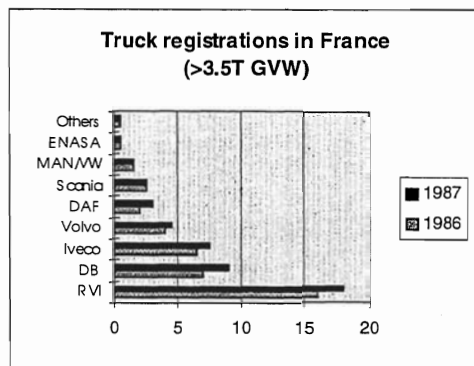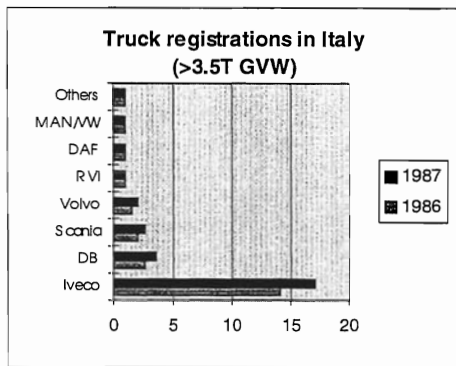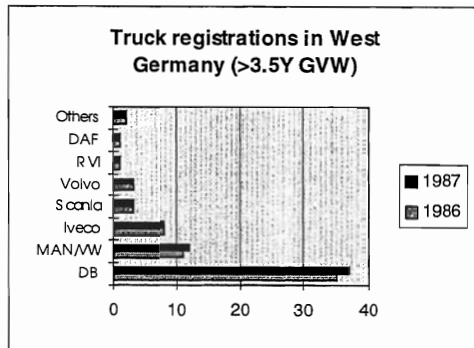
Truck registrations in the Netherlands (>3.5T GVW)

Truck registrations in West Germany (>3.5Y GVW)

Truck registrations in Italy (>3.5T GVW)

Truck registrations in France (>3.5T GVW)

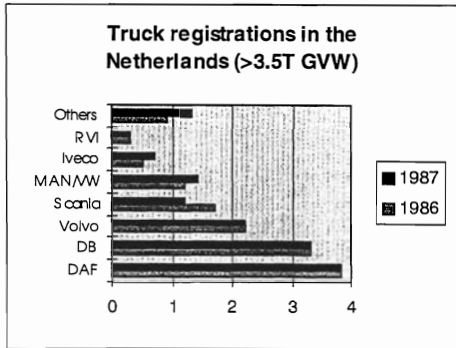**Truck registrations in the U.K. (>3.5T GVW)**

Figure 3: registrations of trucks >3.5T GVW in West Germany, Italy, France, the Netherlands and the UK

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In three out of the five countries (i.e. Italy, West Germany and France) one domestic manufacturer heavily dominated the national market. In general one can say that most European truck manufacturers in 1989 adopted a more multinational strategy than a global or European strategy. Most players tried to maintain a number-one position in one country, but had a much smaller market share in the others. Only Daimler Benz made attempts to evolve to a more global European position.

2. *Strategic group mapping*

In analysing corporate strategy it is useful to look more closely at the decisions truck manufacturers have made with respect to the following aspects of competitive scope:

- Segment scope: in which product segments is the company specialised?
- Industry scope: in which industries is the company active?
- Vertical scope: what is the degree of vertical integration, backward as well as forward?
- Geographical scope: which geographic strategy is followed; in how many countries is the company active?

In the late 80's there were considerable differences in the range of products offered by truck makers in Europe. Some manufacturers (e.g. Daimler Benz, Iveco) offered a wide range of products in all size and weight classes and applications, while others (e.g. Scania, DAF) concentrated on only one segment. Parallel to this difference in segment scope, when mapping the manufacturers along the vertical integration axis, a tendency can be seen for manufacturers with a full line to be more vertically integrated than manufacturers offering only a narrow line (see figure 4).
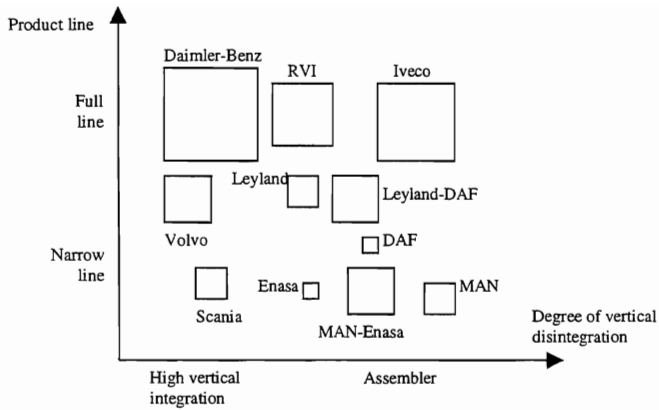
Source: adopted from Simaey (1987) and Reekmans (1989)

Figure 4: Vertical integration and product line

At the same time these full line-manufacturers took on a more international oriented position, whereas the more focused manufacturers were still very concentrated on national markets (see figure 5).
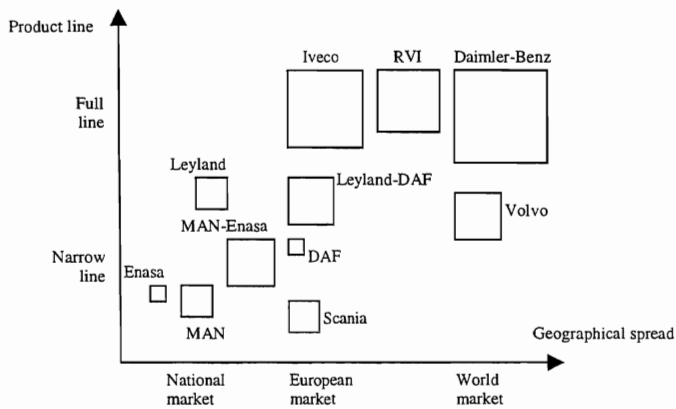
Source: adopted from Simaey (1987) and Reekmans (1989)

Figure 5: Product line and geographical spread

Combining these differences in geographical segments, vertical and geographical scope, two strategic groups could be identified. A first group of manufacturers focused on one segment, that was not highly vertically integrated and concentrated mainly on national markets. The second group took on a broader scope in product range as well as geographical segments and was usually more vertically integrated.

From the strategic maps it can again be concluded that in the late 80's the relevant market in the European truck industry was definitely not the EC. There also appears a marked difference between full line suppliers and specialised heavy weight truck suppliers. Nevertheless, although several truck manufacturers were still very dependent on their national market, this situation seemed to be changing. Through mergers and acquisitions some of the national players are trying to reposition themselves on a more pan-European side following the economic integration of the European Market (e.g. M.A.N., DAF).

Conclusion

The European truck industry application illustrates very well how business tools as strategic group mapping and relative market share positioning can be useful in cases of relevant market delineation. They yield interesting indications of the boundaries of a market. Moreover, combining both methods, an integrated view on both product *and* geographical scope can be developed.

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