

The strategic grounding of competitive advantage – The case of Scania

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Abstract

Scania has performed well above average in the heavy truck industry during a considerable time span. Scania's sources of competitive advantage are presented and their interrelations and significance for the business strategy analysed in order to explain the success of Scania. Strategic issues are traditionally analysed in a top-down procedure starting with the corporate strategy and proceeding by disaggregation of the strategy down in the organisation. This is known as the grand strategy perspective and views strategy as a "chain of causality". We introduce the grounded strategy perspective which views strategy as a "pattern in a stream of decisions and actions", and takes its starting point in the stream of activities within the company. Grounded strategy synthesises the strategy according to a bottom-up procedure. The case of Scania and the heavy truck industry is analysed according to these two different perspectives on strategy. The methodological approach may be different depending on the perspective. The results of the case study from each perspective reveal interesting implications to strategists: scholars as well as practitioners. The grand strategy approach appears to be advantageous for analysis at the higher levels of strategy, while the grounded approach appear to be advantageous at the lower levels of strategy.

Keywords: Strategy; Grounded strategy; Top-down; Bottom-up; Sources of competitive advantage; Item standardisation; Modular production; Scania; Heavy trucks

1. Introduction

What are the sources of competitive advantage? This was one of the main questions posed by The Swedish Advisory Panel on Productivity. An

objective of the Expert Report No. 6 [1], one of nine studies prepared for the Panel, was to identify companies that performed very well within their industry and explain the external contingencies as well as company factors leading to this above-average performance. In order to explain the success of each company, its strategy as well as the sources of competitive advantage had to be analysed.

Some 10 industries of importance to Swedish industry were selected. Within each industry, a "best practise" company in the global arena,

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together with one Swedish company, was chosen for an in-depth analysis. This study is based on the heavy truck industry, in which the best practise company was the Swedish company, Scania. Porter's frameworks [2–4] for analysing competitive factors in companies, industries and nations were used as the main theoretical foundation for the study. Porter [3, p. xvi] states that: "Competitive advantage is about how a firm actually puts the generic strategies into practice". The generic strategies are: cost leadership, differentiation and focus [2]. A formal analytical process is advocated where analysis of the chains of causality is the focal point. The strategy process is formal and disciplined, leading to well-defined strategies at different levels. This perspective of strategy, and competitive advantage, is called the "grand strategy" perspective. It takes the top level corporate strategy as a starting point, then "disaggregates" the strategy in a analytic manner down in the organisation.

Is the top-down approach of this grand strategy theory a true reflection of the realities of strategy formulation in companies? The approach rests on a set of assumptions of what constitutes reality, an issue that we will not resolve here, merely point out some general implications. Predictability is one assumption that grand strategy rests upon, and that strategies can be detached from their subjects is another. A third assumption is that the strategy-making process can be formalised. Mintzberg [5] argues that none of these assumptions holds true. In that case, successful strategies, can hardly be deduced theoretically, or planned in a formalised manner. Strategies and sources of competitive advantage may not lend themselves to be forced into deduced, predefined taxa.¹ Making the net of taxa finer in order to avoid getting stuck between two broad taxa, may not help. The finer the net, the

more pieces a complex phenomenon has to be chopped into, perhaps losing its characteristics in the process. Instead, strategies may be grounded in the organisational activities of the company and ought to be studied and analysed according to their distinctive credentials.

It may thus be fruitful to study the sources of competitive advantage from a "grounded strategy" perspective. Sources of competitive advantage ought thus be allowed us to build their own taxonomy,² rather than being forced into a "one fits all" pattern. The majority of the studies in the literature use the grand strategy approach thereby consolidating this perspective by assuming it to be the theoretically correct approach.

Methodologically, a similar tension exists between "grand theory" and "grounded theory" [6]. Grand theory is generated from logical assumptions and speculations concerning how things ought to be. These logico-deductive theorists, with the primary aim of verifying existing theories, claim that there is one, optimal, theory for an area of research. Grounded strategy, on the other hand, emphasises theory as a process, developing in the interaction between the empirical work and the evolving theory by joint operation of collection, coding and analysis of data. This method is inductive and apt for generating new theories. Both generating and testing of theories may be needed, calling for multiple theories in contrast to the directly monopolistic implications of grand theory. The theoretical discussion concerns research processes performed by a single researcher. However, the same conceptual idea may be applied to the collective research performed in an area. Much of the theory on strategy is based on grand strategy studies. Therefore, more grounded studies are demanded in order to satisfy the condition of interaction between the collectively deduced theories and the inductive, empirically grounded, generation of new theories.

For the individual researcher, it may be beneficial to use both grand and grounded approaches on the same empirical material, in order to obtain

¹ Taxa are sets of entities sufficiently similar to each other and sufficiently different from the entities in other such sets that they are separately delimited and named [25, p. 415]. A category is a level in a hierarchical classification and is composed of taxa. For example Porter's [2] scheme of generic strategies is a category which consists of three (or four) taxa: cost leadership, differentiation, and focus (cost focus or differentiation focus) [25].

² "Taxonomy is the theory and practice of delimiting and classifying different kinds of entities" [25, p. 415].

a more comprehensive description, as well as making it possible to analyse differences in the outcome of the study depending on the approach used. We propose that the collective field of research on strategy needs more research based on a grounded methodology to complement the body of grand strategy research.

The purpose of this study is to describe the sources of competitive advantage for Scania, the Swedish heavy truck producer, and how these sources may have been used to build up Scania's strategy. The two perspectives on strategy and competitive advantage; grand strategy versus grounded strategy, are both used as tools in analysing the case. The results of the case study from each methodological point of view reveal interesting implications to strategists: scholars as well as practitioners. The comparative analysis of the results of the two methodologies reveal methodologically interesting findings. The scheme of the study is as follows. Firstly, grand strategy versus grounded strategy is discussed, then the methodology of the study is described. Thereafter, the case of Scania is analysed in accordance with each perspective, starting with grand strategy, followed by grounded strategy. The implications from the case study regarding competitive advantage as well as the methodological implications are then discussed. Finally, conclusions are drawn and suggestions for further research presented.

2. Grand strategy versus grounded strategy

Strategy has been defined in many different ways and the definitions have evolved over time. Hax and Majluf [7] have made a review of the literature on strategy and they advocate a separation of the concept of strategy from the process of strategy formation. Six dimensions of strategy are found and combined into a single comprehensive definition of strategy [7, p. 102]. Normann and Ramirez [8] state that "strategy is the art of creating value", or more specifically, the conceptual models allowing managers to identify opportunities for bringing value to customers at a profit for the company. Porter [9] proposes that the central question in strategy is why firms succeed or fail. In this study

we are not aiming at a distinct definition of strategy, but rather what constitutes strategy. Porter's [9] proposition is used as a working definition of strategy. From the literature it is evident that strategy exists at different levels. Authors may divide the strategy hierarchy differently, but the three levels: corporate strategy – business strategy – functional strategy, constitute a conventional division.

Different perspectives on strategy have been presented by, for instance, Chaffee [10] and Johnson [11]. Mintzberg [12] has identified ten distinct schools of thoughts on strategy formation. Although it can be argued that several authors would fall between a dichotomisation between grand strategy and grounded strategy, this distinction is advantageous considering the purpose of this study. The three levels of strategy and the two main perspectives on strategy are illustrated in Fig. 1.

The discussion in the literature is often limited to the two upper levels of strategy: *corporate strategy*, which embraces several different business units within a corporation, and *business/competitive strategy*, which is the overall strategy for a single business unit. Functional strategies have, until recently, been parsimoniously treated in the literature, but are gaining in interest. *Manufacturing strategy* is an example of a functional strategy. Strategy can be divided along other dimensions, of which Hax and Majluf [7] provide several examples. In this study, a dichotomisation is made between, on the one hand, grand strategy, where strategy is viewed as a "chain of causality" [9, p. 96] taking corporate strategy as a starting point and, on the other hand, grounded strategy, which views strategy as a "pattern in a stream of decisions and actions" [13, p. 935], taking the starting point in the stream of activities. "Activities" [9] is used as a collective term for decisions and actions.

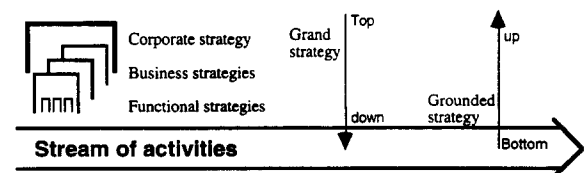


Fig. 1. A hierarchical model of grand versus grounded strategy.

Strategy as chain of causality is advocated, among others, by Michael E. Porter, who has devised a collection of tools for analysing a company's competitive position within an industry, as well as synergies between companies in different industries. Factors related to the nation in which the company is located are also part of the total analysis model. The domain of the analysis covers all three strategy levels and the external contingencies, but has its starting point in the corporate strategy. Porter also discusses value activities, which are the discrete building blocks of competitive advantage [9]. These building blocks are affected by factors inside the company as well as in the company's environment.

Core capabilities is a frequently discussed concept used by advocates of the grand as well as grounded strategy perspective. Leonard-Barton [14] provides a comprehensive discussion on core capabilities and their down side called core rigidities. Several other authors using similar concepts are reviewed in the process. For instance, Prahalad and Hamel [15] take a step from grand toward grounded strategy and discuss a company's "core competencies", as the "roots of competitive advantage" [15, p. 82]. They are the collective learning in the organisation, especially on regarding "how to coordinate diverse production skills and integrate multiple streams of technologies." Core competencies are thus another incarnation of the building blocks discussed by Porter. The term originates from "distinctive competencies" [16], which are the unique strengths a firm possesses. Core competencies should be used as a means of optimising and sharing between different value chains within the scope of the corporate strategy [15, p. 83]. Although core competencies are embedded in the stream of activities, the authors are still top-level analysts in the sense that they take corporate strategy as a starting point, and even cast doubt upon business strategies in discussing the "tyranny" of business unit strategies [15, p.86]. Furthermore, they can be accused of getting carried away by their own circular argumentation: "Successful firms are successful because they have unique resources. They should nurture these resources to be successful" [9, p. 108].

The other main perspective on strategy, as a pattern in a stream of activities is advocated by Henry Mintzberg, among others. Instead of viewing strategy as primarily logically deduced, strategy is viewed as emergent from contingencies. Deliberate strategies, as advocated by the chain of causality branch are not excluded, it are rather the other endpoint on the scale from purely deliberate strategies to purely emergent strategies, none of which exists in reality in its pure form. In order to discover strategies, the empirical data unfold as a pattern in the stream of activities in the company, it is argued. Strategy can hence not be totally planned in an analytical way. Instead, strategic thinking is the solution, implying synthesis, involving intuition and creativity. Strategy making is an "immensely complex process, which involves the most sophisticated, subtle and, at times, subconscious elements of human thinking" [5, p. 111]. It is argued that the most successful strategies are visions, not plans.

We thus have two main perspectives on strategy. The first perspective, grand strategy, the analytical top-down approach, is about defining the sources of competitive advantage and hence strategy either inside or outside the company. "An important theoretical issue is where in the chain of causality to best cut into the problem" [9, p. 115]. The goal of research is to develop the theories until "we can highlight the relatively few variables which can be measured and rigorously examined statistically" [9., p. 116]. The other perspective, grounded strategy, which is about synthesis and is a bottom-up approach, is aimed at finding the pattern that stands out in the stream of activities in the company. "Three decades of experience with strategic planning have taught us about the need to loosen up the process of strategy making rather than trying to seal it off by arbitrary formalization" [5, p. 114].

We conclude that the debate on strategy is as lively as ever. The important thing, however, is perhaps not to decide that one approach is right and the other one is wrong, but to keep the discussion alive, thus sharpening both perspectives. According to Miller and Mintzberg [17], it is generally accepted that we best understand our world by first doing analysis and then synthesis, by dividing things up into components and then putting

them together in some form of intelligible composite. The design of this study includes an analysis of the case according to the grand strategy perspective and then a synthesis according to the grounded strategy perspective.

3. Methodology

The choice of company and industry was dictated by exogenous factors, to fit into the broader study by the Advisory Panel. This study is, however, delimited to the case of Scania. The research started in 1991 with a literature study on the formal theory of competitive advantage and the empirical area of the truck industry. Parallel with the literature study, personal interviews with leading employees within and around Scania were performed. Some 20 managers within Scania were interviewed with semi-structured interviews during a one-year period. Interviews were conducted until theoretical saturation was reached, that is no substantial additional information was obtained by additional interviews [6].

There is a risk that employees, consciously or subconsciously, will describe their company in a favourable light. In order to ensure the validity of the material, additional interviews of respondents outside the company were therefore performed. High-ranking employees who had left the company were also interviewed. The competitors, especially from Volvo were interviewed as were several subcontractors, retail dealers and hauliers. The number of external respondents were approximately the same as for Scania personnel. Also, the interview methodology was similar, but the topics of the interviews were chosen in accordance with interviewed person's relation to Scania. Numerous truck drivers were also interviewed. These non-Scania interviews confirmed most findings, corrected some and provided some novel information as well. These interviews were of importance to the study.

The objective of the competitor interviews was to gain additional information concerning Scania. However, in order to know what is unique for Scania, other truck producers had to be studied in depth as well. The case of Scania was thus further clarified by a comparative analysis of an additional case study, although the case description, due to

space restrictions, is not presented in this study. The extra case was selected in order to maximise the difference between the two companies. The Italian-based company Iveco was chosen and the production unit in Ulm, Germany studied on site. Similar interview procedures were used. Iveco was chosen since it, in contrast to Scania, consists of several previously independent producers, throughout Southern Europe. They have not enjoyed as high a reputation for quality products as Scania and Iveco allows a wider range of customer definable options. Furthermore Iveco is regarded as selling relatively inexpensive trucks. Although this case study is not described in this study, it has affected our view of Scania and has therefore been valuable. The other competitors on the world market have also been analysed, but via secondary material.

The analysis has been refined, in an iterative manner, by additional interviews with the same and other people, in order to correct for inconsistencies in the material and to improve reliability. The theoretical framework and the literature review have also been improved in the same manner.

4. Empirical findings – the case of Scania

In this section, the empirical findings from the case of Scania [18] are condensed into a concise case description. Firstly, the case is analysed according to the grand strategy perspective, with Porter's [2–4] methodology with three levels of analysis: nation, industry and company (business unit). In this study, the company level is the focal point, hence the national and industry level are not discussed in depth, but are elaborated on sufficiently to provide the contextually relevant information. Due to difficulties in the analysis on the company level, the grand strategy analysis is supplemented with an analysis performed according to the grounded strategy perspective.

4.1. Scania according to grand strategy

4.1.1. National level

Environmental factors, collectively called “the diamond”, underpin the competitive advantage on

the national level. They can be arranged in four broad categories: *factor conditions, demand conditions, related and supporting industries* and finally *firm strategy, structure and rivalry* [4]. The most important aspects for Scania on the national level are summarised briefly below.

The fact that Scania started its production in Sweden and still has its headquarters there has been important. The prerequisites for transportation – a long country (over 1500 km), hard climate, the most liberal road regulations in Europe – have forced Scania to produce very durable trucks, in order to satisfy the home market demand. The continuous competition with a powerful competitor, Volvo, which has to be matched at all times, has also sharpened the competitive strength of Scania, as well as Volvo. Due to these circumstances, Swedish truck owners are very difficult to satisfy. The importance of national factors for the heavy truck industry is indicated by the fact that Volvo, who has had the same prerequisites in this respect as Scania, is the second best performing company in the world.

4.1.2. Industry level

The heavy truck industry can be divided into three distinctly different markets, North America, Europe and Japan. Outside the three major markets, other markets exist such as Australia, South America, Africa and Eastern Europe which, however, have a limited effect on the structure of the competition in the major markets.³ Japan differs from the North American and European markets primarily in legislation; the size and capacity of trucks being limited. This has had profound consequences though, prohibiting Japanese producers from building and testing trucks in the heaviest range in their home market. As a consequence, Japanese export of heavy trucks is very limited and Japanese heavy truck producers have virtually no chance of repeating the export success of the Japanese auto industry.

The European and North American markets are open to trucks of similar size but have a fundamentally different product and production concept. In the USA, companies on the supplier side are substantially more powerful than their European counterparts. The North American suppliers have gained ground in the value system⁴ at the expense of the truck producers. The American truck producers are basically truck assemblers who allow the customer to decide which brand of engine, gearbox, etc. to install in the truck. In the European market, on the other hand, the heavy truck producers have retained more control of product development and production of the power train, which is regarded as *the strategic parts* of the truck. In Europe, trucks can thus be optimised as a system instead of optimisation of individual components. As a result, no American trucks are sold in Europe, and practically no European trucks are sold in America. Furthermore, for producers such as Mercedes, RVI and Volvo, who have all bought American truck companies, no synergetic effects are gained by being represented on both sides of the Atlantic, at the component level or at the item level.

It is thus not relevant to apply an industry analysis to the global market for heavy trucks, but the unit of analysis should be the European market which, from an analytical point of view, is regarded as an industry. Further analysis is limited to the European market using Porter's [2] five forces framework, analysing the prime determinants of the potential for high returns.

In the European heavy truck industry, the truck producers are large enough to dominate the other companies in the value system. Neither *customers* nor *suppliers* are, with few exceptions, powerful enough to threaten the truck producers and their profitability. *Substitute products* and *potential entrants* into the industry are also weak forces. Substitutes exist only for a narrow portion of the total freight market. For goods with a very high value per kg, air transport may be a substitute. For very heavy goods with low value per kg, train and/or barges may be substitutes. Except for these, there

³ The South American market is, however, a very important market for Scania as a company.

⁴ The vertically interconnected value chains of several companies [3].

are, today, no real substitutes for trucks. For potential entrants, the entry barrier into the industry is very high. Throughout each market, not only where trucks of a certain trademark are sold, but also everywhere they are used, a network of service stations must be established. This is both time consuming and very costly, thus making new entrants into the industry very unlikely.

The fifth and remaining force, the jockeying for position among *rivals* in the industry, is the most powerful force in the European heavy truck industry. This means that for the industry as a whole, in order for a company to be successful it has to be large enough not to be swallowed by another competitor, and furthermore it must be able to produce trucks, in a cost-efficient way, which are differentiated from the average truck produced by its competitors. During the last 25 years, the number of European producers has been reduced from over 20 to less than 10. Several of the remaining companies have, moreover, merged into larger strategic alliances. One exception is Scania which is not involved in any major collaboration with its competitors.

4.1.3. Company level

The fundamental basis of above-average performance in the long run is sustainable competitive advantage. Achieving competitive advantage requires a firm to make a choice between the generic strategies: cost leadership, differentiation, or focus. "Competitive advantage is about how a firm actually puts the generic strategies into practice" [3, p. xvi]. The value chain is "the fundamental tool in diagnosing competitive advantage" [3, p. 27]. Scania is hence analysed according to generic strategy and a condensed value chain analysis, but first a brief case synopsis.

In the 1940s, the managing director, Carl-Bertel Nathhorst, laid out a set of rules for Scania. Being a relatively small company in the global arena, their resources had to be utilised economically. Scania focused on the heavy segment, which was expected to grow proportionally more than the small and medium segments. Furthermore, according to Nathhorst, Scania could never dictate what a customer should buy, neither could a customer be allowed to dictate what Scania should produce. Therefore, the trucks had to be built from a modu-

lar component system connecting market demand with production economic aspects. Another aspect of his philosophy was to develop and produce the strategically important parts of the truck in-house and work in close cooperation with the suppliers for other parts. Export should be emphasised in order to gain volume. [19, pp. 239–241].

According to Porter [2], any company, thus also Scania must pursue one of the generic strategies. Scania must have been doing so since the 1940s because they have been able to sustain their competitive advantage during this time. Consequently, Scania must be either a cost leader, differentiator or a focuser. Two types of focuser exist: cost focuser and differentiation focuser. Which is Scania?

Being *focused on the heavy segment* while excluding light and medium trucks, Scania acts as a focuser. Scania is furthermore the only truck producer on the European market with this distinct focus. There is a sharp divide between heavy trucks, on the one hand, and medium and light, on the other. None of the major components is interchangeable between heavy and other trucks. It is not either possible to produce heavy and other trucks on the same production lines due to differences in size, components and production technology. Hence, focusing on the heavy range will lead to less complex and thus more efficient and less costly production. Also product development, marketing and service become less complex and costly without any major losses of synergy. For instance, few customers are shared between the segments. Scania thus appears to be a cost focuser.

On the other hand, if *heavy truck production* is regarded as an industry in itself, which is reasonable considering the distinct production technology and customers, then Scania may not be a focuser. Scania's *item standardisation, modular production system* and volume due to export, are factors that generate cost reductions in production. With item standardisation and modularised production, the number of components required to produce the different models of trucks is significantly reduced, especially since the standardisation extends from the bottom to the top of the product structure, and across the different models. A heavy truck from Scania consists of about 8000 items. Trucks from other producers consist of roughly 12000 items.

For its complete range of trucks Scania uses around 20 000 items while the equivalent for most competitors is more than 30 000 items. This has a number of direct and indirect effects on production. Firstly, the economies of scale are affected positively. When a company introduces modularised production, the volume of the individual components increases although the number of finished products is constant. This gives economies of scale on the item level, which is where scale is of importance. The effect on the experience curve is analogous. Other positive effects will occur indirectly, such as reduction in the stock level due to the reduction in the number of different items in stock. Further effects are a reduction in capital tied up in stock and a reduction in costs related to the handling of the material, for instance, the cost of storage facilities and staff. Scania thus appears to be a cost leader.

If Scania is cost leader, it cannot be a differentiator at the same time, because if they were they would have become “stuck in the middle” [2]. A differentiator “seeks to be unique in its industry along some dimensions that are widely valued by buyers” [3, p. 14]. Important aspects for differentiation of heavy trucks are quality and durability of the truck, measured, for instance, by down time due to service and repair. To the truck user the cost of a running a truck is dwarfed by the cost of a truck breaking down, not only due to the cost of repair but to the cost of not performing the expected delivery. Scania’s modular component system along with *in-housing* of strategic components and *out-sourcing* of others, provides an optimised power train system instead of optimised components, recognised in the industry as one of the absolutely best power trains. Furthermore, Scania’s *distribution and service organisation* is well represented throughout the markets where Scania trucks are used. Virtually no customers and few competitors would disagree that Scania trucks are among the brands with the highest quality, as perceived by the customer, which is where quality counts. Thus Scania appears to be a differentiator in the heavy truck industry. Scania has furthermore focused on the market segments for single-truck hauliers and long-distance haulage which makes them appear to be a differentiation focuser.

According to Porter, a company must make a choice between which kind of competitive advantage it wants to seek and either follow a cost leadership strategy, a differentiation strategy, or one of the focus strategies. If a company tries to follow more than one strategy simultaneously it will risk being “stuck in the middle” [2]. Three exceptions to the rule exist, none of which apply to the heavy truck industry. It is argued that, none of these conditions is stable over time, and will eventually erode the company to a position below average return in the industry. Scania has, however, maintained profits which are substantially higher than those of its competitors over a considerable time span. We thus conclude that the case of Scania is not consistent with the generic strategy theorem. It is not possible to place Scania only in one of the four squares of generic strategy with maintained dignity. Nonetheless, Scania has maintained profits substantially higher than the industry average during a considerable period.

The next step of the grand strategy analysis is a value chain analysis, “the fundamental tool in diagnosing competitive advantage” [3, p. 27]. The firm is disaggregated into “a collection of discrete but related production functions” or activities that underlie competitive advantage. The value chain analysis rests partly on the chosen generic strategy, making the analysis troublesome in the case of Scania. There are five generic categories of primary activities: inbound logistics, operations, outbound logistics, marketing and sales and service. Item standardisation and modular production belong mainly to *logistics* and *operations*, reducing the overall complexity. The close cooperation with suppliers is mainly part of *inbound logistics*. *Marketing and sales* are not substantially different from those of its competitors, except for the high product quality which will naturally facilitate marketing and sales. *Service* is an important factor for Scania accounting, in part, for the high quality perceived by its customers.

Furthermore, there are four support activities, embracing all the primary activities: procurement, technology development, human resource management and firm infrastructure. The *in-housing* of strategic components and *out-sourcing* of others is a *procurement* activity supporting primarily

inbound logistics and operations. The modular system, especially of the parts produced in-house fall under *technology development*, improving the product as well as the process. Furthermore, Scania was at an early stage at the forefront concerning employee relations. The “Scania-Vabis spirit” was for a long time a characteristic of the company. Today, however, the *human resource management* at Scania is not substantially different from that of other similar employers. The *firm infrastructure* is unusual in the sense that the manager of, for instance, the engine/transmission department is responsible not only for production, but also for product development and engineering. The same is true for sub-units within these units. Authority is thus delegated via the product, not via function, facilitating analysis of changes in the product, from several perspectives at the same time, thus reducing the transaction cost. In other respects Scania has had a traditional, functionally divided organisation operating by “management by instructions”, with strict demarcation between operative and administrative tasks [19].

The industrial logic behind Nathhorst’s rules was primarily economies of scale, and product quality. Scania has lived by these rules and has thus been able to achieve and maintain cost efficient production and also obtain a price premium on its products through differentiation in the market by high-quality products. From the company level analysis we conclude that neither the generic strategy model nor the value chain adequately pinpoints the sources of competitive advantage and their relation to business strategy. Both are taxonomies for splitting strategies and activities respectively into, figuratively speaking, a set of boxes. The sources of competitive advantages, however, appear to ignore the limiting walls between boxes, since they more often than not extend over several boxes, and furthermore appear to be interrelated in a way too complex to be maintained through disaggregation. Up to (or rather down to) a certain level, the analysis through disaggregation appears to be of help, but beyond this level, the complexity makes the disaggregation troublesome and more questions are raised than are answered by the procedures.

One major unanswered question remains: which generic strategy does Scania really have? Another

relevant methodological question is: can the sources of competitive advantage be described in a better way, than by the three or four generic strategies, the five generic categories of primary activities and the four support activities?

4.2. Scania according to grounded strategy

Instead of breaking down a generic strategy into the activities of the value chain, taking the opposite standpoint may have advantages at this level of analysis. That is, looking at what is, and has been, happening in Scania without being restricted by labelled boxes that define strategies and activities. Let us therefore look directly at the sources of competitive advantage for Scania. Several aspects have already been brought up in the grand strategy analysis.

4.2.1. Sources of competitive advantage

Item standardisation and *modular production* are cornerstones in Scania’s strategy and have already been discussed in the generic strategy discussion above. These were some of the main priorities set up by Nathhorst in the 1940s, but were conceived originally by August Nilsson already in the 1930s. Item standardisation and modular production are not just techniques for a simple product structure, they are also strategic issues, in shaping the way of thinking throughout the organisation. The fact that these ideas have imprinted the organisational priorities for such a considerable time-span that nobody working in the company today has experienced any other way of thinking on these matters, is a very strong force, and exceedingly difficult for competitors to imitate, although they are moving in that direction. A lead of over 50 years is, however, not easily caught up with.

Focusing exclusively on the heavy truck segment has, for one thing, meant that Scania cannot present a complete range of trucks. Other producers, for instance Iveco and Mercedes, can offer a complete range from light trucks via medium to heavy trucks. The comprehensiveness of the product range is considered to be an important and valuable part of their strategy. The advantages of a complete range of products can theoretically arise

from the possibility of gaining economies of scale, or sliding down the experience curve to reduce costs. As concluded earlier, no such advantages can be achieved by producing heavy trucks in conjunction with light and medium trucks. Therefore, adding medium and light trucks to the heavy range will not generate any positive effects on the product or the production, it will primarily lead to a higher degree of complexity and thus higher costs.

In-housing and *out-sourcing* are about deciding which items and components to produce in the company and which not. "Today manufacturing focus means learning how not to make things – how not to make the parts that divert a company from cultivating its skills, parts its suppliers could make more efficiently" [20, p. 98]. The approach is based on a simple principle: focus on the components critical to the performance of the product in the market. The company has to be distinctively good at making those components in-house. Out-source the other components, where suppliers have a distinct comparative advantage. The key components of the truck are the parts constituting the power train: engine, gearbox and transmission, all connected by a universal drive joint assembly. The other parts, frame and cab, are also important but not as complicated and costly as the power train. Scania (and also Volvo prior to their collaboration with Renault) produce optimal systems by developing and producing all the strategic components in-house, thus maintaining *full control* of the development process, which further presupposes *no horizontal collaboration*.

Having one manager responsible for production as well as product development and engineering means that all technical changes to any part of the product will be analysed simultaneously from the product development point of view, as well as the production point of view. This is an efficient way of integrating into the organisation some of the effects sought by *concurrent engineering*. Scania had practised and gained from this form of organisation for a considerable period of time before it became in vogue.

The *corporate culture* of economising resources has been characteristic of Scania, and has led to a low break-even point for production, making

positive returns possible even when volumes are low. This is especially important for the heavy truck industry where volumes are cyclical with substantial variations. Scania is dominated by technical staff. The company has thus been at the forefront of technical development within the industry, partly leading the industry with technical innovations. It has also been at the forefront concerning employee relations. The workers at Scania were formerly called the "pork chop brigade" due to their high wages. Scania was one of the last companies to join the Swedish model of a "wage cartel", prohibiting higher wages than in other companies.

Export, instead of a wider product range, is used as a means of achieving high volume and thus economies of scale. Today, 97% of Scania's global production is sold outside the Swedish market. Furthermore, Scania also aims to reach a market share in parity with its competitors who have the highest market share in each market Scania chooses to compete in, thereby sustaining their competitive advantages by acquiring advantages of market leadership on the markets where Scania competes.

These rules are by no means static, but are dependent on the current contingencies, external as well as internal, that are changing over time. For example, avoiding horizontal collaboration in order to maintain full control presupposes that the internal R-D is competitive. If not, the company's competitive advantage will deteriorate slowly if the competitors, or their suppliers, develop at a faster rate, and dissolve quickly if the competition shifts to a new technology. This happened to Scania after the end of the Second World War in 1945, when the post-war range of vehicles and engines (that had been developed with unprecedented speed) began to reveal a considerable number of defects, due to unproved new materials and insufficient time for testing. Scania therefore concluded a working agreement with Leyland Motors Ltd (at that time one of the Europe's leading producers of diesel engines, trucks and buses). The agreement made it possible for Scania to reduce the lead that their competitors had gained as a result of problems at Scania, and furthermore to "jump-shift" from their own precombustion-chamber diesels to the new direct-injection engine. The company also ventured

afield in seeking partners and ideas for the development of its new city buses for the 1950s and signed a license agreement with Mack Manufacturing Corp. in the USA. Already in 1936 Scania's first diesel engine was introduced following a working agreement with the German producer Magirus (now part of Iveco). At the same point in time, the company realised that it would not be feasible to build a sufficiently strong dealer network based on their products alone. Scania thus managed to be awarded the agency for Volkswagen cars, providing sufficient volume for the dealer network. The agency also proved to be profitable, the profits being used to finance the internationalisation of Scania's primary operation, trucks [19, 21].

4.2.2. Interrelations

From the analysis of the sources of competitive advantage, several of the sources can easily be paired together since they directly support each other. Item standardisation and modular production support each other, as is the case with in-housing of strategic parts and out-sourcing of others. Avoiding horizontal collaboration and maintaining full control of product development and the production process also support each other. These relationships are easily detected but the other sources of competitive advantage also support each other.

Scania has avoided horizontal collaboration with direct competitors (except when necessary, as in the post-war period) in order to maintain its modular production and item standardisation. Being forced to bargain with a cooperating party would increase the number of items as well as substantially reduce the advantages of the modular production system (one of the basic ideas behind cooperation is to share items and components). By avoiding horizontal collaboration, the product development process can become a continuous process within the company without external interference from bargaining with allied truck producers. The process is therefore less complex, since all contacts are within the company, and faster, since no consideration has to be taken of products other than their own. The diffusion of knowledge to competing companies is also slower than is the case with collaborating parties, which keeps the

competitive advantages within the company for a longer period of time. All its competitors in the heavy segment are, furthermore, producing a wider range of trucks than Scania. If Scania were to choose to collaborate horizontally with another producer, they would indirectly be forced to abandon its focus on the heavy segment and at the same time give up its full control of the product structure and production.

A greater variety of products available to the customer is usually an advantage for the producer. However, the lack of these theoretical advantages is not perceived as a major disadvantage by the heavy truck customers, since they cannot use lighter trucks for their transportation needs, and vice versa. Focusing on the heavy segment, thus makes the marketing of the product less complex, as well as the after-sales service. Scania has consciously built up an effective after-sales market, realising that they are not just selling a truck, but a truck that can be repaired quickly, should it break down. Focusing on the heavy segment generates advantages all the way from R and D via engineering, production and marketing to after-sales service.

Item standardisation and modular production, which presupposes non collaboration and full control within the company, reduce costs in production by achieving economies of scale. Another means to this end is *exporting*, which increases scale effects. *Scania's corporate culture* is also a means to the end of low cost in the production. At the same time as item standardisation and modular production are means to lower cost, they are means to the end of producing high-quality trucks that can be sold at a premium price. *Focusing on the heavy segment* also enhances higher efficiency due to the reduced overall complexity of the organisation. *Concurrent engineering* will likewise integrate product and production aspects already at the design phase, facilitating the production of a high-quality product.

The sources of competitive advantage for Scania are interrelated, thus supporting each other in order to simultaneously allow for low costs in production and the ability to differentiate Scania's products from those of their competitors by high quality, which is the prime dimension for differentiation of heavy trucks. All of Scania's sources of

competitive advantage support either economies of scale or the production of high-quality products. Several support both. The sources of competitive advantage discussed above further support each other and depend on each other in such a way that synergies exist between several of the sources. The sources and their synergetic effects add up to Scania's business strategy. Some of the sources are individually clearly more important than others, but arranging the sources in order of importance would not be meaningful. All sources fit into a pattern which would be weakened by the removal of any source, irrespective of its individual importance. This well tuned system of supportive sources of competitive advantage is the strength of Scania's strategy.

5. Discussion

In this study, we have shown for the case of Scania that using two different perspectives on strategy will enhance the understanding of the business strategy. Porter's grand strategy frameworks for analysis on the national and industry levels: the diamond and five forces are well suited for the analysis of the external contingencies. The top-down analytical approach works well within these premises. However, in order to analyse factors inside the company, further top-down disaggregation of the strategy by deduced pre-defined taxonomy does not facilitate the understanding of the case. Instead, the bottom-up grounded strategy approach advocated by Mintzberg is advantageous. Viewing strategy as emergent, and searching for the sources of competitive advantage in the pattern in the stream of activities in the company, facilitates the understanding of the sources of competitive advantage, especially their synergistic interrelations.

The dichotomisation between cost leadership and differentiation appear reasonable at first. The model is deceptively simple: choose one or the other or you will get lost in between. However, when it comes to distinguishing in practice between those companies that pursue cost leadership and those who pursue differentiation, few companies fit unequivocally into one or the other taxa. Several

scholars have attacked the idea based on empirical evidence of the coexistence of these generic strategies [22, 23]. One line of research has been devoted to developing more general business strategy taxonomies, by adding dimensions thus making the net of taxa finer. For instance, Mathur [24] has developed a taxonomy of sixteen generic strategies and Chrisman, Hofer and Boulton [25] have developed another taxonomy of sixteen generic strategies. The authors thus, consciously or unconsciously, embark on the road, the foundation of which was laid by Chrisman, Hofer and Boulton [25], towards an "optimal" business strategy classification system. Other lines of research have also evolved, for instance, Hill [26] who proposes that a combination of low cost and differentiation is possible and may even be necessary, in order to establish sustainable competitive advantage. Our findings support Hill's proposition.

It is probably not possible to create a better generic strategy taxonomy than Porter's, with as few as three or four taxa. The solution in the literature has been to develop more general business strategy taxonomies with more taxa. We argue that this does not address the real problem of being stuck between taxa. Making the net finer will just relocate the problem. The real problem is related to the multi-dimensional characteristic of strategy, which makes an attempt to force strategy into a two-dimensional taxonomy troublesome. Furthermore, by constructing a set of pre-defined options, the degree of conceptual freedom for managers and scholars is severely restricted. Porter's [2] notion of "stuck in the middle" puts a restriction on the minds of scholars and managers concerning the pursuit of cost leadership *and* differentiation, thereby restricting the implementation of such strategies. Presenting the simultaneous pursuit of cost leadership and differentiation as falling between two boxes may therefore have serious toxic side-effects on the success of companies following these guidelines.

Instead we propose to look beyond the taxonomy at the sources of competitive advantage within the company. Taxonomies can be advantageous for the broader aim of making general classifications of aggregations of companies, but often fall short when it comes to classifying, guiding or analysing

single companies. The case of Scania, which we have analysed with both a grand strategy approach and a grounded strategy approach, reveals valuable methodological implications. The external contingencies on the national and industry level are pinpointed by the grand strategy analysis according to Porter's methodology, the national diamond [4] and the five forces [2]. However, further disaggregation becomes more troublesome the further down in the strategy hierarchy it is pursued. This is illustrated through the analysis of Scania, in which Scania can be argued to pursue all of Porter's four generic strategies. Advocating any one of these generic strategies as Scania's is easy, what is difficult is excluding the other three. In Porter's terms, Scania is definitely stuck in the middle and has been so during a considerable time span, however, contrary to Porter's prediction, with maintained well above average performance within the industry. Therefore, we propose that Scania has found "luck in the middle". Another case study in Expert Report No. 6 [1], the case of Motorola [27], confirms the finding of a favourable competitive position with the simultaneous pursuit of more than one generic strategy.

The analysis of Scania according to the grand strategy perspective is pursued further down from the generic strategies to a value chain analysis. The value chain provides a finer net of taxa than the generic strategies. However, the understanding of the case of Scania is not facilitated by this analysis structure. The sources of competitive advantage for Scania do not comply with either the generic strategy theorem or the finer net of taxa applied in the value chain analysis. Scania's strategy is therefore, as a complement to the grand strategy analysis, also described with a grounded strategy approach. The description takes the starting point in Scania's sources of competitive advantage, thus allowing the case to construct its own taxonomy. This description provides a deeper insight into the strategic realities of the company, than forcing the competitive advantages into a predefined taxonomy, as in the grand strategy approach.

According to the grounded strategy approach, the most *successful strategies are visions not plans* [5]. In the case of Scania, visions were what Nathhorst provided for Scania and he further insured

the growth and implementation of this vision by assigning personnel who favoured these ideas to key positions before leaving Scania [19]. He thus left a testament in the form of the strategy as well as the means to carry it through. This shows that successful strategies can build impetus over time to become very powerful within the company. It could be argued that what Nathhorst provided was a plan, but a plan intrinsically assumes predictability, a formalised strategy-making process, and that the strategy can be detached from its subject, none of which holds true. A vision is furthermore flexible in several respects, allowing for continuous adaptation to changing circumstances.

The sources of competitive advantage are bound to change over time. For instance, the cost of research and product development increase over time making it necessary to continuously *re-evaluate decisions concerning core components and out-sourcing*. Basic research concerning, for instance, emission reduction and new materials for pistons is demanding more and more resources. Larger volumes than Scania's may be needed in the future to distribute these costs. It is worth noting that engine producers such as Cummins and Caterpillar are producing 250 000 and 150 000 engines annually, compared with Scania's 40 000. The company is already in close collaboration concerning some core components; with Bosch for electronic equipment and Karmann for cab components [19]. Scania has had a long history of successful cooperation with suppliers and independent consultants. In the future, the cooperation may need to be extended further to deeper cooperation with suppliers and independent consultants. Even the possibility of future cooperation with competitors cannot be eliminated due to changes in the industry's structure. A major challenge in that perspective is maintaining the advantages of non-horizontal collaboration, by item standardisation, modular production and the ensuing advantages related to economies of scale and high-quality products.

By wisely choosing the items to be produced in-house and those to be out-sourced, the steepest experience curve and the largest reductions in the cost of production, due to economies of scale, can be utilised. The product components can be divided into core components, where there are few suppliers

and high premiums, and commodity components, where suppliers are plentiful and the margins will be thinner. Core components are typically those that make differentiation possible. A decision to out-source is often irreversible since competence within the company is eroded, and the cost of closing the competence gap may render it impossible to produce the component in-house ever again. The North American market is a good example of what can happen. In the USA, the components of the power train are produced by independent suppliers with substantial volumes making it very expensive for a truck producer to start producing their own engines, for example. Furthermore, the customers are used to being able to specify the power train themselves, which is an other conserving force in the current North American heavy truck industry. The American truck companies are hence *assembling* their trucks (with the exception of Mack Trucks) and not really *producing* them, as in Europe.

The potential for *economies of scale* are quite different for different value-adding activities. Generally, the economies of scale are greater the more automated the production. The assembly of trucks is partly craft work, making the economies of scale level out at an annual production of around 10 000 units. For the production of items, or sub-components, scale may be the major determinant of production cost. For instance, fuel injection systems, which can be regarded as a strategic part, are supplied by the German supplier Bosch. This has two major explanations. No truck producers volume can be compared with Bosch's, hence their scale advantages can not be matched. Furthermore, Bosch have supplied these parts since the 1930s, which has allowed Bosch to slide further down the experience curve than any single truck producer could have done. Bosch has thereby been able to position itself as a very strong supplier. A similar effect can be seen in the North American market concerning the components of the power train.

Admittedly, we have not ruled out alternative explanations for our findings in the case of Scania. For example, one could argue that the success of Scania may be influenced by variables not studied here or that their success is the effect of sheer luck.

Perhaps Scania were just lucky that the heavy truck segment did grow faster than the other segments, even though growth had been predicted. However, viewed from a grounded strategy perspective, Scania's sources of competitive advantage are strategically relevant individually, and further strengthen each other providing a strong case for the conclusions. Therefore, we believe that the data we have presented support the relationship between Scania's sources of competitive advantage and Scania's financial success and success on the market.

6. Conclusions

In order to address the initially posed question, Scania's sources of competitive advantage have been described and were found to support each other mutually; firstly, in achieving *economies of scale* at the item level which is where scale is important, and secondly in producing *high-quality products* and thereby justifying a price premium on the market. *Item standardisation* and *modular production* support each other, as is the case with *in-housing* of strategic parts and *out-sourcing* of others. *Avoiding horizontal collaboration* and keeping *full control* of the product development and production process also support each other.

Item standardisation and modular production, which presupposes non collaboration and full control within the company, reduce costs in production by achieving economies of scale. Another means to this end is *exporting*, which increases scale effects. *Scania's corporate culture* is also a means to the end of low cost in the production. At the same time as item standardisation and modular production are means to lower cost, they are means to the end of producing high-quality trucks that can be sold at a premium price. *Focusing on the heavy segment* also enhances higher efficiency due to the reduced overall complexity of the organisation. *Concurrent engineering* will likewise integrate product and production aspects already at the design phase, facilitating the production of a high-quality product. Thus, the other sources of competitive advantage also support each other in a well tuned system constituting Scania's business strategy.

We conclude that all sources of competitive advantage for Scania are interrelated to support each other mutually in order to simultaneously allow for low costs in production and the ability of differentiate their products from the competitors with high quality, which is the prime dimension for heavy trucks. The sources and their synergetic effects add up to Scania's business strategy. Some of the sources are individually clearly more important than others, but arranging the sources in order of importance would not be meaningful. All sources fit into a pattern which would be weakened by the removal of any source, irrespective of its individual importance. This well tuned system of supportive sources of competitive advantage is the strength of Scania's strategy. Subsequently, Scania consciously pursue several generic strategies simultaneously and successfully, and have done so during a considerable time span.

This leads to the next finding in this study. Porter's [2] generic strategy theorem does not appear to be a true reflection of the competitive realities. This conclusion is supported by several other studies. We go one step further and suggest that by constructing a set of pre-defined options, the degree of conceptual freedom for managers and scholars is severely restricted. Thus, presenting the simultaneous pursuit of cost leadership and differentiation as falling between two boxes may have serious toxic side-effects on the success of companies following these guidelines. Contrary to Porter's prediction, Scania has maintained well above average performance within the industry and has found "luck in the middle". It is thus a misconception that it is a disadvantage to be "stuck in the middle". We argue that the reason for the misconception is the dilemma of analytical model building; to be constrained to force a multi-dimensional concept, as strategy in our study, into a two-dimensional taxonomy.

Finally, this study presents some normative suggestions for future research on strategy and sources of competitive advantage. The sources of competitive advantage should be studied without being influenced by pre-defined concepts of what the sources are or might be. It may not be fruitful to force a choice between a pre-defined set of options. The sources of competitive advantage are grounded

in the activities in the organisation rather than in the matrices of strategic planning. The sources emerge from the stream of activities within the company, however, external contingencies also affect the utilisation of the sources of competitive advantage. Strategy as a concept covers both the sources of competitive advantage *per se* and the connection to external contingencies. In order to understand the business strategy of a company the contingencies above the company have to be explained as well as the sources of competitive advantage and their interrelationships within the company. These two perspectives of strategy do not convey the same description or the same prescription, but are methodologically and conceptually complementary. Both the grand strategy perspective and the grounded strategy perspective add valuable information and mutually support each other.

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