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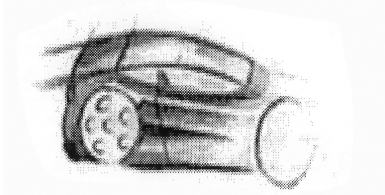
Strategies for German automobile manufacturers facing new competitors from low-cost countries

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Abstract

This article discusses the challenges created by new suppliers from low-cost countries specifically for German automakers. These new competitors are increasingly reducing their deficiencies in skills, supplier structure and costs. Therefore, strategic responses conceivable for German automakers are derived in three steps: starting with identifying business unit strategies, detailing them in the international competition and especially detailing them in competition for competences. Hints on potential reactions in the race for competences are given by an empirical inquiry.

Keywords

Strategies, competition from low cost countries, German automotive manufacturers, outsourcing, modularization

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1. Introduction

Although challenges from new suppliers on the world's markets and possible responses by established companies are much-discussed current events, there is little or no research available on these topics specifically. This gap is evident in recent publications, e.g., the special issue of the German *Zeitschrift für Betriebswirtschaft* titled "The East Asian Challenge" (Pascha, 2006). While offering articles on the challenges, e.g., from South Korean and Japanese corporate groups, there is nothing on the strategic reactions of companies in highly developed (high-wage) countries. Another recent contribution is a study by the management consulting firm The Boston Consulting Group (2006) about "The new global challengers," i.e., aggressive companies from rapidly developing markets that are attacking the market turf of established corporations. This study has been widely discussed in the German media. But it, too, offers only vague advice about possible strategic responses by companies in high-cost countries.

In the field of international management, white spaces exist in the research on how established companies are trying to compete with new rivals from low-cost countries. Studies in international management have focused on the globalization of companies based in high-cost countries ("going und being global"). There are some publications about direct investment in markets outside the triad countries (North America, Europe, and Japan) (cf. Thomas and Grosse, 2001; or Owhoso et al., 2002) and some analyses of the management approaches in individual countries, such as China (cf. Peng et al, 2001 or Park and Luo, 2001). The special characteristics of management in emerging markets are only rarely discussed (one exception is Wright et al, 2005). Possible responses by established companies based in highly developed (high-wage) countries have yet to be investigated.

In strategic management, research in recent years has focused mainly on managing competencies and on competency-based strategies (cf. the overview by Acedo et al, 2006). There has been little or no investigation of strategies for emerging markets. The only exceptions are some more broadly based works (cf. Jaeger and Kanungo, 1990; and above all Austin, 1991 and 2002) that cover the institutional differences between the emerging economies and the triad and the resulting alternative strategies, such as large groups (the keiretsu and chaebol models) and informal networks as ways of compensating for weak institutions (cf. Khanna and Rivkin 2001, as well as Guillén, 2000 and Peng, 2002). The resource-oriented approach is gradually being applied to emerging markets, mainly to explain change processes associated with learning and changes in the structure and use of resources (cf. Uhlenbruck et al., 2003). Specific strategies and reactions to challenges from low-cost countries have, however, not been considered.

This paper therefore asks the question: what approaches in international strategic management can companies in high-cost countries employ to compete with new rivals from low-cost countries? The term "low-cost countries" is used deliberately, and not emerging markets or growth markets, because low cost is more relevant to the critical issue for international strategic management: the new challengers' continuing wage cost advantages are more threatening than the vigor of their domestic economies or the growth rate in their home markets¹.

Illustrating these issues using the automotive industry is a natural choice, since it is a major part of the economy in Germany and faces ever-tougher challenges from new competitors based in low-cost countries. The precise question is thus: what strategies can German automakers use to compete with new suppliers from low-cost countries? To be even more precise, the scope of the discussion here is the business unit level, specifically, the car division. The challenges facing these business units are described in part 2. Their options for action are discussed in part 3, which recommends a three-step approach and provides an empirical reality check. The discussion concludes in part 4 with an outlook for future cooperation between automakers and their suppliers.

2. Challenges from low-cost countries for German automakers

The challenges will be illustrated here using two companies as examples: 1. SAIC, based in China and 2. Tata Motors based in India. The Shanghai Automotive Industry Corporation (SAIC) has revenues of € 11 billion and has so far entered joint ventures with both Volkswagen and GM. The company plans to increase production from 800,000 units a year in 2004 to 2 million units in 2010. To accomplish this, SAIC is creating a new middle class/mid-range brand by purchasing intellectual property from (for the Rover 25 and 75) and from Ssangyong in South Korea.

Tata Motors in India, a company with current sales of € 3.8 billion and a return on equity of more than 25%, built just 150,000 cars in 2004. The "Indicar," a pickup with a price tag of about USD 7,000 has spread/has proved popular worldwide. By 2010, Tata Motors has plans for much higher unit production growth than SAIC: 360% (to 700,000 cars a year). According to Indian analysts, Tata Motors has "global ambition in all its businesses" and wants to become a significant automotive player by developing entry-level, "popular cars" for USD 2,200 for the domestic market and for export. Tata is said to have agreed with a Canadian supplier on the delivery of 500,000 transmissions a year (cf. Motilal Oswal, 2006). Tata Motors sees its future role as a knowledge center ("we may not become the manufacturing center of the world, but I think we could become very much a knowledge center of the world", Pandit, 2005).

Such growth targets represent a major challenge for German automakers in view of the stagnation on the world market, which is projected to grow from 2004 to 2010 by only 12% (cf. EIU, 2006). In addition, the automotive industry suffers from high surplus capacities. According to a study by PriceWaterhouse Cooper (2002), production capacity utilization in the automotive markets in triad countries is currently only 80%; in the automotive markets outside of the triad utilization may be as low as 60% (cf. also Maxton and Wormland, 2004).

New automakers such as SAIC and Tata Motors also represent a major challenge to established competitors because three widely held assumptions in international management concerning competitors from less developed countries are no longer valid:

1. Competitors from low-cost countries have skill deficits.
2. Competitors from low-cost countries lack a robust supplier structure.
3. With economic development, the labor costs of competitors from low-cost countries increase sharply.

Ad 1: Analyses show that the new automakers are closing the skills gap vis-à-vis European competitors. A company survey conducted by Abele et al (2006) confirmed that the incisive skill advantages in Western Europe are expected to decrease from 2004 to 2010, particularly in terms of know-how, qualified workers, and logistics and IT know how.

Ad 2: Competitor analyses show that the new suppliers from low-cost countries have increasingly qualified suppliers (cf. Maxton and Wormald, 2004; Abele et al, 2006). For example, Johnson Electric, a manufacturer of electric motors for headlights and seats near Hong Kong, operates the latest equipment, makes products of very good quality, and has established itself as the world's cheapest supplier of electric motors, not only for automobiles.

Ad 3: The wage-cost advantages of the new automakers will continue. According to estimates by the Economist Intelligence Unit, the current gap between Germany (with an hourly wage of € 26.40 for a skilled worker in 2004) and India (€ 2.30) or China (€ 1.90) will scarcely decrease over the next 10 years. The fact that the process of economic development is not raising wages – at least not in highly populated low-cost countries such as India, China, and Brazil unlike rapidly growing economies (in the past, Japan and South Korea; today, the Czech Republic) can be explained by the enormous growth of the skilled labor force in these highly populated countries. In China and India alone, estimates indicate that around 1.4 million engineers, mathematicians, technicians, and scientists will complete their studies in 2010, twelve times as many as in the United States (cf. The Boston Consulting Group, 2006). In view of the huge reservoir of unskilled and skilled workers outside the major metropolitan areas, companies can prevent wage increases by bringing in low-wage workers from the countryside.

3. Derivation of possible strategic responses to the challenges from low-cost countries

The derivation of possible strategic responses by German automakers has to include three steps. Initially, a starting point has to be found in a company's business unit strategies. Then this strategy has to be adapted for implementation in international management. As the automotive industry is experiencing frenzied vertical competition between automakers and their suppliers, a second set of adjustments is needed to implement the international divisional strategy in the context of vertical competition. An empirical reality check of the options deduced is presented in the last subsection 3.4.

3.1 Business unit strategies as starting point for developing possible responses

Business unit strategies – understood as market coverage or competitive strategies – are sets of allocation decisions designed to achieve competitive advantages (cf. Aaker, 1992), i.e., decisions about the allocation of scarce resources to many or only a few market segments and for certain competitive advantages. According to the widely acknowledged classification of Porter (1980 and 1985), a business unit's choice of competitive advantage consists of selecting between:

- | Consistently low costs for all value-adding activities (low-cost advantage, which supports cost leadership in the marketplace) and
- | Uniqueness from the customer's perspective in all value-adding activities (differentiation advantage, which supports a differentiation strategy).

These two poles have to be supplemented with mixed (Greek: hybrid) strategies of cost-minimal differentiation. While Porter excluded such strategies because the two competitive advantages are supposedly incompatible, their combination can be justified in theory and confirmed empirically (cf. Miller and Dess, 1993; Proff, 2000). The three business unit strategies of cost leadership, differentiation, and hybrid strategies based on cost-minimal differentiation have to be supported by competences.

Hybrid strategies of cost-minimal differentiation are suitable for German automakers, and actually the best response to the challenges posed by new competitors from low-cost countries. Cost leadership alone will not suffice for companies based in high-cost countries.

They cannot replicate the production costs of competitors in low-cost countries. Pure differentiation strategies are possible only in the upper luxury segment, because, in all other segments, price is playing an increasingly important role and price premiums – the ability to command a price above the price for the basic technical performance without a markup for brand and image – are falling. The luxury segment is, however, so small that companies that cover only this segment (without being part of an automotive group) cannot survive (Rolls Royce phenomenon). Moreover, they would also need differentiated products with high price premiums in the other market segments as a form of protection against competitors, yet the degree of differentiation and the size of the price premium shrinks as customers' price sensitivity increases (Proff, 2000).

In order to pursue a hybrid strategy in competition with new competitors from low-cost countries, German automakers have to pursue a strategy of reducing costs without losing differentiating features.

There are two main levers for achieving *cost reduction without loss of differentiation* (cf. Fig. 1):

1. Reduce average costs with superior resources or with more efficient use of resources, i.e., for example, by using wage-cost advantages (comparative cost advantages by producing in low-cost countries)
2. Obtain lower production costs through an optimal division of labor (value added) with specialization advantages. Production costs in the market are by definition lower than in any given company ($\Delta C > 0$), which means that when value-adding activities are outsourced, their production cost in the anonymous market is always less expensive than within a company (Williamson, 1975, 1985). This specialization advantage decreases with increasing specificity (k) of the products (from basic nuts and bolts to complicated gearboxes). Such outsourcing to the market is limited because it simultaneously increases transaction costs compared with internal production ($\Delta G < 0$) (cf. Williamson, 1975, 1987). Costs such as contract preparation, processing, and monitoring increase with increasing factor specificity. For this reason, a company should outsource only until the transaction cost disadvantages of a market transaction outweigh the production cost advantages (point k^*). The goal is to outsource without increasing the transaction costs.

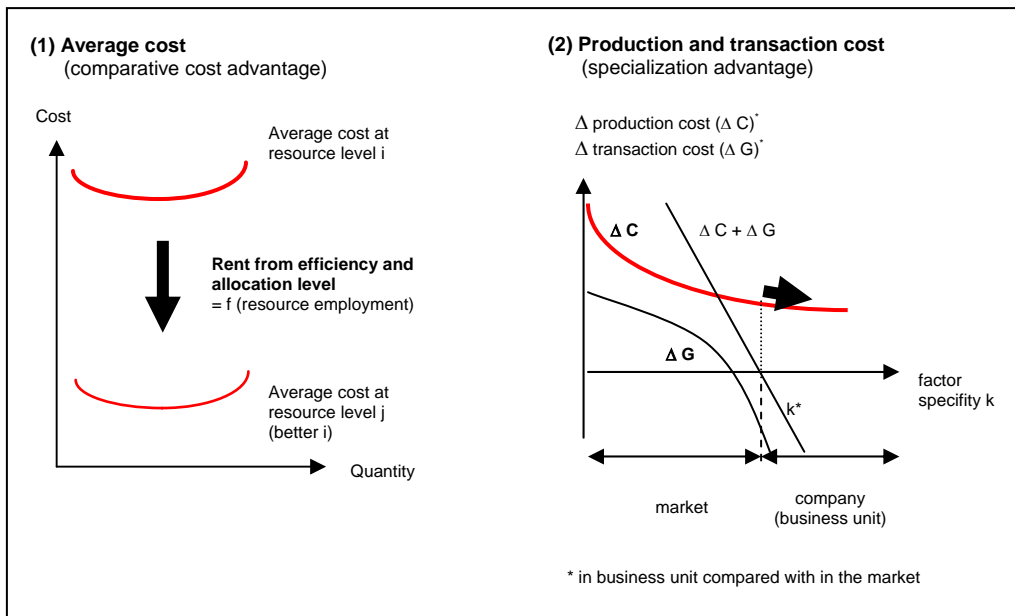


Fig. 1: Options for reducing cost without losing differentiation

3.2 Implementing business unit strategies in international management

As a result of the link between the two cost reduction options (use of comparative cost advantages and specialization advantages), recent macroeconomic literature has justified and recommended three strategic options for cost reduction in international management (cf. Feenstra, 1998; McLaran, 2000; Grossman and Helpman, 2002; 2003a, b):

- | Moving production operations abroad,
- | Offshore outsourcing, and
- | Outsourcing "on shore," i.e., to traditional suppliers (cf. Fig. 2).

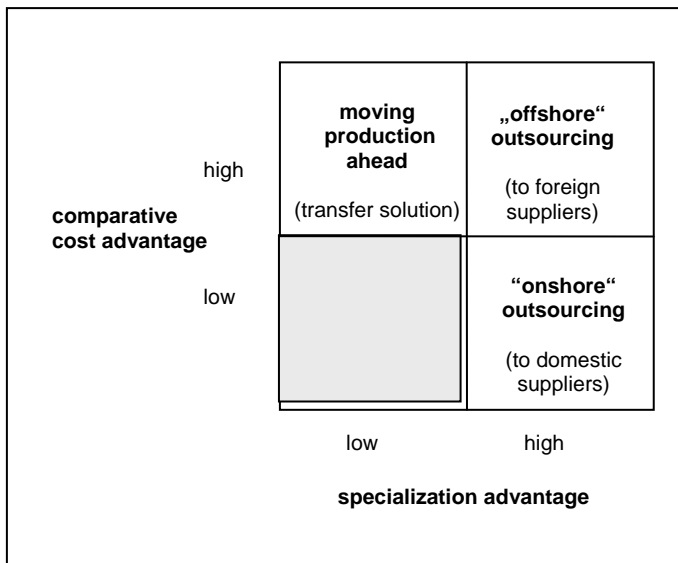


Fig. 2: Strategic options for reducing cost without losing differentiation in international management

Source: Grossman and Helpman (2002); Robinson and Kotakota (2003)

Moving production operations abroad means that a company transplants its production operations to low-wage countries and stops production at high-wage locations. In the past, this option was widely used by German companies in the textile and apparel, shoe, bicycle, and toy industries. In the automotive industry, however, this option runs into several problems: long production start-up times abroad, the commitment of resources (both skilled labor and capital equipment), and capacity surpluses worldwide (cf. Maxton and Wormland, 2004; Abele et al, 2006). Surplus capacities are a particularly thorny issue because existing capacity in the automotive industry cannot be reduced or only at a high cost for severance plans.

Offshore outsourcing means assigning value-adding activities to new suppliers in low-cost countries. At first glance, offshore outsourcing appears to be the best option, because it exploits both types of cost reduction (cf. Corbett, 2004). This option was pursued by the German automotive industry in the first wave of outsourcing the production of simple parts until 2000. In the current second outsourcing wave, with more specific parts requiring a higher share of technology development, however, this option presents major problems, above all management and quality problems as well as an undesirable loss of knowledge. Analyses by Leiblein and Miller (2003), and Craig and Willmot (2005) show that as many as two out of three outsourcing projects fail or fail to meet the initial expectations for cost reduction. Generally

speaking, it is also hard to limit technology transfer only to the outsourced parts, which creates the risk of unwanted technology transfers and loss of intellectual property (cf. Dietz et al, 2005). As for *outsourcing* to traditional suppliers who buy parts abroad, achieving production cost advantages requires automakers to come to grips with their transaction costs. This can be done by treating *modularization as a condition for outsourcing*.

Modularization means breaking a complex system into its individual parts and standardizing the interfaces between these parts. This transforms the complex systems into construction kits or building blocks. The elements that can be isolated are standardized such that they become less specific and can be outsourced to traditional components suppliers at a minimized transaction cost. The modular approach is particularly advanced in the computer industry, but it has already begun making inroads in the aircraft and automobile industries (e.g. Fixson, 2002a; Sanchez and Mahoney, 2001; Langlois 2002; Worran et al., 2002).

Modularization thus also influences the boundaries of the company as an organization, i.e., the decision whether to "make" or "buy" (e.g. Dyer, 1996, 2000; Combs and Ketchen, 1999; Novak and Stern, 2003) and the distribution of skills and decision-making authority between end-product manufacturers (the original equipment manufacturers or "OEMs") and component suppliers over time. Through modularization's influence on the division of skills and decision-making authority, it also influences how the OEM and supplier divide up the resulting profit (cf. McGrath et al., 1995). By modularizing car components and outsourcing their development and production, an OEM can cut costs in the *short term*, - the savings are primarily on labor costs, but also on product development costs (through higher development efficiency), purchasing and production costs (through economies of scale), and investment costs (through decreasing investment) (Milgrom and Roberts, 1990: 515; Takeishi and Fujimoto, 2001). If an OEM increases the use of standard modules in order to reduce the number of parts to be designed and quality-optimized by the product development function, it can reap not only cost savings from economies of scale and lower use of expensive development resources, but also capture savings from slashing development times (Thomke and Reinertsen, 1998; Robertson and Ulrich, 1998).

Outsourcing based on modularization enables an OEM to reduce costs without sacrificing differentiation, because it reduces production costs and, as a result of the lower specificity of supplier-produced parts and more efficient administrative processes, limits transaction costs. But this option also poses problems: in the automotive industry, one can observe a relative loss of knowledge of value-adding activities to suppliers. Long-term, the shift in the skill base can threaten an OEM's differentiation potential (Teece, 1996). For this reason, OEMs that compete on differentiation are particularly affected by modularization. Their price premium compared with that of a "value for money" OEM stems from above-average product characteristics that can only be sustained by skill advantages over suppliers (Rao and Monroe, 1996).

On balance, given that OEMs can better manage outsourcing than offshore outsourcing and thus keep the loss of knowledge in check and incur lower transaction costs, that outsourcing is faster and ties up fewer resources than moving production abroad, it follows that *outsourcing to traditional suppliers should be the preferred option for responding to the challenges of new competitors from low-cost countries*.

As competition with carmakers from low-cost countries intensifies, more outsourcing is vital – but it must be preceded by greater modularization to prevent the undesirable loss of competences to traditional suppliers. In short, outsourcing needs to be competence-based.

3.3 Implementing the international business unit strategy in vertical competence competition with suppliers

Ways to limit loss of knowledge when outsourcing to module suppliers can be identified in explanations of the competence development over time, which require a sequence of competence improvements and renewal over. When outsourcing, OEMs can counteract the loss of competence through constant competence renewal. For this reason, it is necessary to revisit explanations of competence renewal in the context of the theory of competence development in order to justify actions that prevent the relative loss of competence to suppliers in the context of competence-based outsourcing.

In the literature, there have been several attempts to make competence perspectives more dynamic by integrating explanations of competence development. Explanations of competence development are based on static explanations of how competencies are built up from input resources (assets and capabilities) (Barney, 1991; Peteraf, 1993). According to these explanations, competence building must fulfill three main requirements: 1. creation of customer value, 2. limited tradability and limitability and 3. coordination of competitive advantages and environmental dynamics. At the same time, it is not sufficient to successfully build competencies once. Competencies need to be (further) developed over a period of time, because changes in the external and internal environment of the firm pose a threat to the sustainability of competitive advantages. Competencies, like all assets, lose value over time (McGrath et. al., 1995).

Competence development can take place either as competence upgrading or competence renewal (Baden-Fuller and Volberda, 1997; Volberda and Baden-Fuller, 1998). While competence upgrading aims at perfecting competencies over time, competence renewal builds up competencies not available in the firm till that point (Baden-Fuller and Volberda, 1997; Volberda und Baden-Fuller, 1998). Competence upgrading and renewal as proposed by Baden-Fuller and Volberda correspond to the capabilities deepening (upgrading) und broadening

(renewal) put forward by Argyres (1996). Argyres' competence theory can therefore be made more dynamic.

Changes in the environment act as disruptions during competence building. They can operate at the level of input resources, and the three main requirements for refined resources. The changes can pertain to: 1. changes in the financial resource base, 2. changes in the way managers perceive competencies to create customer value, 3. the undesired diffusion of knowledge, and 4. changes in the environmental dynamics specific to the firm (external shocks). Such changes are the "drivers" of competence development, and form the basis of a theory of competence development. They provide four explanations of competence development, that could be empirically verified (Proff, 2005):

1. The firm-specific resource base changes cyclically as a function of the economy, and, it follows, the earnings position of the firm (Jensen, 1989). Given an essentially increasing resource base, this would alternately necessitate competence deepening (during times when the firm-specific resource base deteriorates), and competence broadening (during periods when there is an improved resource base, see Volberda and Baden-Fuller, 1998).
2. Changes in how managers perceive competencies to create customer value force them to act. This results alternately in competence broadening when there are core rigidities, and competence deepening when there is chaos (Huff et al., 1992; 1994, Leonard-Barton 1992).
3. For low levels of knowledge diffusion, competence deepening suffices, while heavy knowledge diffusion necessitates competence broadening. When regarded over a period of time, the significance of competence broadening increases relative to competence deepening (Parvitt, 1985; Langlois and Robertson, 1995).
4. If external shocks are higher than in the preceding period, competence deepening is necessary; if external shocks are lower than in the preceding period, competence broadening is possible (Schneeweiß and Kühn, 1990).

These partial explanations can be combined into a comprehensive explanation of the development of competencies over a period of time, which lies at the center of a theory of competence development (see Fig. 3):

An ideal form of "cycling" exists between competence broadening and competence deepening, as stated in the first two explanations. Over a period of time, competence broadening gains in relevance vis-à-vis competence deepening because of an improved financial resource base, and increasing levels of undesired knowledge diffusion (as stated in the first and third explanations). External shocks can determine the choice of one or the other form of competence development for individual firms.

As noted before, OEMs (in this case automobile manufacturers) at present are often ceding competencies, in relative terms, to the module suppliers. Thus, instead of being at point A on the curve of competence development, representing an ideal "cycling" or alternation between competence deepening and competence broadening in Fig. 3, (even differentiating) OEMs are usually located below the curve (B), because they tend to focus more on upgrading competencies rather than building new ones.

As a result, more and more competencies are lost to suppliers, because with declining relative specificity vis-à-vis the market, it becomes difficult to bind these competencies to the firm over a period of time. In the extreme case, differentiating OEMs, especially, are unable to broaden competencies at all. They are forced to outsource more and more competencies (point C).

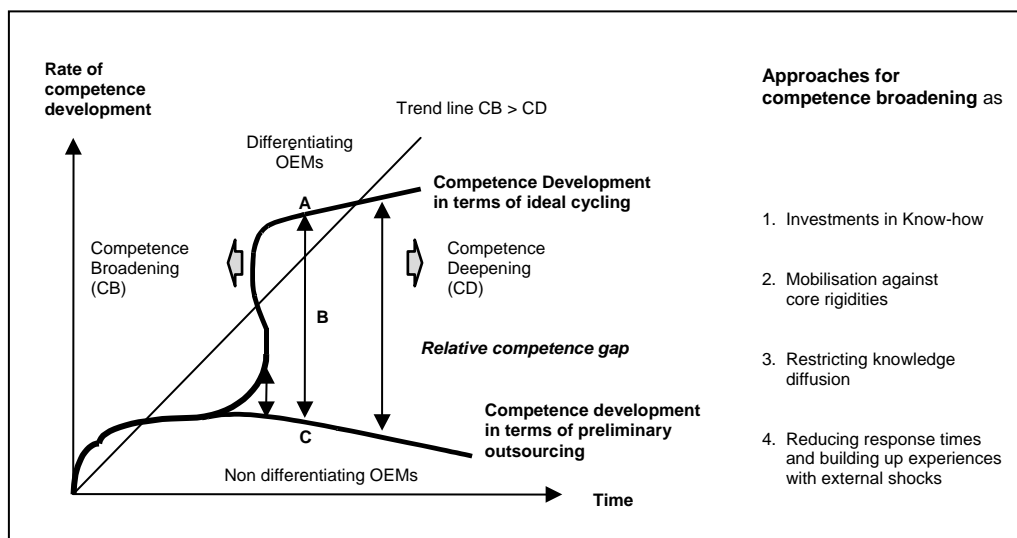


Figure 3: Competence development of OEMs

Several top managers, but also researchers, believe that they are merely shifting tasks through modularization, while managing to retain knowledge and competencies (Takeishi, 2002; Dosi et al., 2005). Yet, in practice, outsourced tasks and knowledge cannot be separated. A case in point is that of a German automobile manufacturer, which had largely outsourced seat development to a systems supplier but wished to retain coordination over R&D. The seat supplier gradually poached the few employees left in the manufacturer's coordination unit, while other employees switched over to another unit/division within the firm. In this way the competencies were lost completely.

If OEMs wish to prevent too many competencies shifting to module suppliers, they must close the gap by once again "cycling" between capabilities deepening and capabilities broadening, and focusing on competence renewal. If they fail to renew their competencies, the exponential increase in the process of relative knowledge diffusion will lead to accelerated competence outsourcing, which will erode the profitability base of the OEMs. There are four approaches to competence broadening based on the theory of competence development, which OEMs can apply to protect against competencies shifting to module suppliers (see Fig. 3). These four approaches are:

1. *Investments in know how* in accordance with the first explanation: Given that competencies are shifting towards module suppliers, OEMs should utilize the relatively sound resource base in phases when the economy is looking up for competence renewal. During such periods they should invest in know how, which they can continue to feed off during phases when there is a downward trend in the economy. Differentiating OEMs, in particular, can meet the challenge of a relative deterioration in R&D and production competencies, as well as a relative deterioration in integration competencies through investments in know-how.

Investments in know-how only make sense if all the knowledge within the organization can be processed at a relatively low cost, if it is possible legally protect this knowledge, and if the organization's administrative processes are relatively better than those of its competitors and suppliers. The cost disadvantage vis-à-vis the market (Teece, 1996) consequently decreases, as also internal governance costs. This leads to the first option on how OEMs can achieve capabilities broadening in response to the outflow of competencies during increased modularization, namely

| option 1: insourcing of core competencies.

Apart from insourcing, the threat of competence outflow to suppliers can also be averted by distributing competencies. Insourcing carries the inherent risk of over-investment. OEMs can therefore also utilize the services of engineering service providers or second tier suppliers in building relative competencies vis-à-vis module suppliers. Additional options on how OEMs can achieve capabilities broadening in response to the outflow of competencies during increasing modularization can therefore be derived, i.e.

| option 2: Cooperation with engineering service providers

| option 3: Cooperation with second tier suppliers.

2. *Mobilization against core rigidities* in accordance with the second explanation: Changes in perception, e.g. perceptions of extreme core rigidities (Volberda and Baden-Fuller, 1998), may lead to pressure to act, which can also be termed organizational stress (Huff et. al., 1992: 55). Analogous to large pharmaceutical companies that are restructuring their R&D divisions through

cooperation agreements and licenses, other OEMs must act directly against such core rigidities and broaden their competencies.

Breaking core rigidities in the firm requires that administrative processes must be substantially improved and made more flexible relative to the market. In other words, the firm's agility must be enhanced. At the same time, the costs of internal knowledge transfer must be kept low and protection of intellectual property ensured even as old structures are dismantled. This move is geared towards reducing governance costs and thereby providing incentives to increase value addition or protect existing value addition. This leads to the fourth option on how OEMs can achieve capabilities broadening in response to the outflow of competencies during increasing modularization, namely

| option 4: improving the firm's agility.

3. *Restricting knowledge diffusion* according to the third explanation: Knowledge is constantly escaping from a firm (Mansfield, 1986) through employee publications and presentations, key employees moving to competitors, participation in R&D collaborations or inter-firm networks (Appleyard, 1996). OEMs need to restrict knowledge diffusion as far as possible.

This implies that secrecy measures for key knowledge are essential, although this is possible only to a limited extent in an age of re-engineering. Situations need to be created in which suppliers reveal knowledge, e.g. through idea competitions or internal supplier exhibitions. A further option regarding how OEMs can achieve capabilities broadening in response to the outflow of competencies during increasing modularization can therefore be stated, i.e.

| option 5: Conducting idea competitions or internal supplier exhibitions.

4. *Reducing response times, and building up experiences with regard to external shocks* according to the fourth explanation: Manufacturers who perceive they are losing competencies to suppliers can renew competencies, especially in periods when external shocks are lower than in the preceding period. This leads to an expectation of higher earnings. They must reduce their response times to external shocks to be able to seize this opportunity (Windsperger, 1991). It is therefore necessary to carefully decide which changes in environment require a response, and which do not. Experience in dealing with external shocks is therefore important. OEMs require internal processes that offer good internal knowledge accumulation and improve change management if they wish to increase their response time and enhance their experience in dealing with external shocks. A further option regarding how OEMs can achieve capabilities broadening in response to the outflow of competencies during increasing modularization can therefore be stated, namely

| option 6: improving change management.

The challenges posed by module suppliers, and approaches to competence broadening allowed us to derive six potential strategic responses of OEMs to the challenges posed by module suppliers. These now need to be empirically examined.

4. Empirical reality check of the options for limiting the loss of competences associated with outsourcing through intensified modularization

The empirical study was intended to obtain inputs on the relevance of the six deduced options. The study was two pronged: it included semi-standardized interviews with module suppliers and automobile experts, as well as car manufacturers. The interview results were then validated through a content analysis of automobile magazines.

Interviews with module suppliers took place between September 2003 and April 2004. 21 suppliers were interviewed in Germany. These included US and Japanese module suppliers. The interviewees were from the firms' upper or top management. Germany was selected as the site for the interviews because this market is extremely significant for differentiating automobile manufacturers, who are the focus of this paper. The interviews were carried out with semi-standardized interview cues (see also Dyer, 1997: 542). Wherever possible, the answers were recorded on a five point rating scale (ranging from 1 "no agreement" to 5 "strong agreement"). It is not possible to conduct standardized interviews or questionnaires on sensitive strategic issues at the upper or top management level (Porter, 1991; Chen and MacMillan, 1992). The interviews could only be held after assurances of complete confidentiality and of not revealing firm names were given. Despite this, there was reluctance to speak about this sensitive issue. Just 45% of the firms that were approached actually took part in the interview. Supplementary interviews were therefore conducted with ten automobile experts.

The interviews with OEMs took place between March and June 2004. Eight automobile manufacturers in Germany (or the European head office) were interviewed. These included subsidiaries of US or Japanese OEMs. Of these, three firms followed a differentiated approach, while five had largely undifferentiated brands.

The insights obtained through the interviews with 21 module suppliers, 10 automobile experts and 8 automobile manufacturers could be confirmed by means of a longitudinal content analysis² of articles in the two German automobile magazines, "Automobil Produktion" and "Automobil Entwicklung". The content analysis was carried out to confirm the results in view of

the relatively large number of firms that declined to be interviewed due to confidentiality concerns.

All reviews on OEMs and/or module suppliers were systematically analyzed for the structured content analysis. The underlying assumption was that the texts presented an accurate picture of the background facts, thereby allowing the context to be inferred from the text. This is feasible for an industry like the automobile industry which gets extensive and sophisticated coverage in the media (Merten, 1995; Früh, 1998). The specific attributes extracted from the articles were transferred into data. Key words were specified as encoding units (Früh, 1998, p. 32) and entered in an encoding sheet, since in this case, as in most business management studies, the analysis concentrates on frequency (e.g. D'Aveni and MacMillan, 1990; Kabanoff et. al., 1995; Schrader and Lütje, 1995). The definition of the encoding units was theoretically derived from the developed options. To enhance the relevance, encoding for the years 1995 to 1997 was converged to the "average value" for 1996; and encoding for the years 2001 and 2003 converged to the average value for 2002. Using the two sample average test, the significance of changes in competencies between 1996 and 2002 were examined. There were about 600 pages of articles per year of "Automobil Produktion" and "Automobil Entwicklung".

The encoding had to be carried out manually because the test phase demonstrated that it could not be standardized. Consequently, a computer aided content analysis, e.g. with the "Textpack" program of the Zentrum für Umfragen, Methoden and Analysen (Center for Surveys, Methods and Analysis - ZUMA) in Mannheim (e.g. Mohler and Zuell, 1998) was not feasible. Moreover, the general intention was not to "completely suppress" the interpretation of the encoder, but simply to "limit and control it in terms of the prescribed definitions" (Früh, 1998: 84-85). Given the existing scope for interpretation, the primary encoding was carried out concurrently by three encoders (Jauch et al, 1980: 3). After jointly reviewing the material, a final "master" code was agreed upon for every year of the period under study.

Interviews with the automobile manufacturers and discussions with module suppliers and experts conveyed that the six strategic responses derived from the theory of competence development are adopted mainly by differentiating OEMs. Non-differentiating OEMs clearly tend to adopt far fewer of these responses (see Fig. 4).

Differentiating OEMs mainly pursue strategies of insourcing and cooperation with Second tier suppliers and engineering service providers (options 1 bis option 3). A significant change in strategic responses of differentiating OEMs was visible only for strategies of insourcing and cooperation with Second tier suppliers and engineering service providers.

Insourcing of core competences is a significant strategy in the tussle with module suppliers. The results of the content analysis also indicate that the significance of this strategy has shown a distinct increase since 1996. Insourcing is most difficult for electrical and electronics components. Automobile manufacturers have already ceded so many competencies here that

they are unable to keep up with developments and have become dependent on suppliers such as Bosch and Siemens VDO.

The interviews clearly showed that it is not possible to safeguard competencies in the long term simply by coordinating module suppliers. In this context, the scaling down of in-house production is less of a threat than scaling down internal R&D. Competencies tend to be lost more easily by outsourcing development activities rather than production.

Strategic reactions of OEMs	Interview 2003/04		Intensification in strategic responses between 1996 and 2002*	
	Agreement with these strategies in response to the challenges posed by module suppliers (n = 39) (1 = no agreement 5 = very strong agreement)		(α)	
	differentiating OEMs	non-differentiating OEMs	differentiating OEMs	non-differentiating OEMs
1. Insourcing	3.1	1.4	0.01	n. s.
2. Coping with engineering service firms	3.9	2.0	0.01	n. s.
3. Coping with tier-2 suppliers	4.1	2.1	0.01	n. s.
4. Improving firm's agility	1.8	1.9	n. s.	n. s.
5. Perform idea competitions between suppliers	2.0	1.5	n. s.	n. s.
6. Improving change management	1.8	1.8	n. s.	n. s.

n. s. = non significant * average value 1995 - 1997 and 2001 - 2002

Fig. 4: Significance of the strategic responses of differentiating automobile manufacturers

Insourcing necessarily implies increased *cooperation* with other market players. The OEM must either reintegrate R&D in the firm, in which case it will require engineering service providers that take on integration and production (option 2). Alternatively, the OEM decides on in-house production, in which case it will need to procure the intermediate products from Second tier suppliers (option 3). These strategies are thus clearly significant for differentiating OEMs. The

results of the content analysis also confirm their increased significance since 1996 (high level of statistical significance α in Fig. 4).

The pursuit of agile organizational forms, change management and the implementation of idea competitions and internal exhibitions are widespread among all OEMs (options 4 to 6), but do not appear to provide any special potential responses with regard to modularization. Idea competitions, for instance, tend to be used more for purchase optimization.

The empirical study showed that competence-based outsourcing in the automotive industry, alongside a well-targeted insourcing of key technologies, requires more cooperation with tier-2 suppliers and engineering service providers in order to reduce costs without losing differentiation in competition with challengers from low-cost countries.

5. Strategies of German automakers in competition with new suppliers from low cost countries – an outlook

This article initially discussed the challenges created by new suppliers from low-cost countries. Specifically, automakers based in low-cost countries

- a) Are overcoming their skill deficiencies,
- b) Are building an increasingly high-performing supplier structure, and
- c) In parallel, can expect to operate with continuing cost advantages.

The strategic responses conceivable for German automakers were derived in three steps: first, a cost reduction without sacrificing differentiation was identified as the (hybrid) business unit strategy to be used as a starting point for devising successful responses to the new challenge. The implementation of this business unit strategy in international management was then discussed and it was demonstrated that the most promising response is outsourcing - provided that it is preceded by modularization of the product design in order to minimize transaction costs. To avoid competence drain, the best approach is competence-based outsourcing. German automakers should pursue this strategy in their increasing competition with companies based in low-cost countries and thus cooperate more closely with their traditional suppliers.

Notes

1. In the World Bank's narrow definition, emerging markets have a gross national income of less than USD 10,200 per capita; a broader definition, e.g., by Hoskisson et al. (2004), also counts transformation countries in this group. According to a definition by The Boston Consulting Group (2006), growth markets are rapidly growing economies with a very favorable cost base and difficult conditions that challenge and develop dynamic companies to see their domestic market as a training field for the world market.
2. The longitudinal content analysis method was successfully used by the Wharton School in Philadelphia, for instance, to measure action-reaction behavior in competition (Chen and MacMillan, 1992; D'Aveni and MacMillan, 1990; Kabanoff *et al*, 1995; Schrader and Lütje, 1995).

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