

RESEARCH PAPERS

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Promoting Synergies in Multiproduct Firms: Toward a Resource-based View

ABSTRACT

We address the issue of promoting synergies in divisionalized, diversified firms from the perspectives of the resource-based view and recent work on corporate headquarters, thus connecting the analysis of sustained competitive advantage with organizational issues. We begin by clarifying the concept of synergy, and argue that the concept of complementarity is particularly likely to capture most meanings of synergy. Furthermore, we argue that the raison d'etre of the corporate headquarters lies in their synergy-creating potential. The reasoning is illustrated with examples from Danish corporations, specifically Danfoss and Bang & Olufsen.

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I. INTRODUCTION

This paper represents a first stab at understanding the role of corporate headquarters as sponsors of synergies in divisionalized multiproduct firms. A primary argument is that part of the *raison d'être* of the corporate headquarters indeed lies in its potential to stimulate synergies; otherwise, it is better to let divisions exist as independent firms or have them managed by other firms whose headquarters can add more value. Developing this argument requires, however, a fine-grained understanding of the notion of synergy – one that has arguably been missing from the literature so far, in spite of the huge popularity of the concept. Thus, we essentially address three issues:

- **Research question 1):** How should we theoretically understand synergies?
- **Research question 2):** How, and by whom, are they promoted?
- **Research question 3):** May we utilize insights developed under 1) and 2) when seeking a rationale for the existence and functions of the corporate headquarters?

Our attempt to address these issues is primarily based on insights from two relatively recent literatures on strategy, firm organization and performance. These are the *resource-based view* on the firm (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993) and recent work on *corporate headquarters* (Prahalad and Bettis, 1986; Campbell, Goold and Alexander, 1995; Chandler 1994; Foss, 1997). Each one of these two literatures stand to gain from being combined with the ideas and insights of the other literature. For example, the resource-based view has not had much to say about organizational issues, such as how corporate headquarters may influence how assets are leveraged and accumulated. Conversely, the relatively small literature on corporate headquarters (henceforth, "CHQ") has not, in our view, fundamentally clarified what it is the CHQ does or may do. However, we are unlikely to fully understand, for example, what seems to be a major wave of restructuring of CHQ (Young and Goold, 1993; Ferlie and Pettigrew, 1996) unless we have a precise understanding of this. Thus, we argue that research on CHQ stand to benefit from recent resource-based research, for example, into the dynamics of asset-accumulation processes and sustainability of competitive advantage. Specifically, we will conceptualize the CHQ as sponsors and coordinators of processes of synergy creation. In other words, we will attempt to put conceptual meat on what Campbell, Goold and Alexander (1995) call "parenting advantage", that is to say, the extra value creation that under certain circumstances may be obtained when a parent firm owns a business, compared to the situation where one of its rivals owns it, or it exists on a stand alone basis. Thus, the CHQ may create quasi-rents, that is, a difference between best and second-best ownership of a business. In our view, these rents are what has normally fallen under the

rubrics of "synergy" or "parenting advantages" (*III. The Corporate Headquarters as Sponsors of Synergies*).

Synergy is one of the most common and admittedly also one of the most diffuse notions in the corporate strategy literature. As a result, there has been some import from economics in an attempt to clarify the meaning of synergy. For example, the concept of *economies of scope* would seem to be one important candidate for a clearer understanding of synergy. However, as we argue there is a static dimension to the concept of economies of scope so that it does not fully capture the richness of the concept of synergy, which – we argue – should be given a much more dynamic interpretation. We focus in particular on the concept of *complementarities* (Milgrom and Roberts, 1990, 1995) as a strong candidate for putting precise conceptual flesh on the concept of synergy, and examine the role of corporate headquarters in fostering complementarities¹ (*Section II: Concepts of Synergy: A Resource-Based Discussion*).

In addition to furthering the understanding of the role and rationales of corporate headquarters, our discussion also has the potential of furthering the resource-based view. Resource-based thought has clarified that firms are constrained in their ability to reap sustained competitive advantages from resources that can be acquired on a market (Dierickx and Cool, 1989).² Therefore the attention has been increasingly focused on internal processes of asset-accumulation as means to keep competitive advantage sustainable. This implies that the process by which assets stocks are in fact accumulated and the factors and mechanisms that hinder or ease asset accumulation ought to receive substantial analytical attention within resource-based thought. Assuredly, in this context the role of the corporate headquarters should not be neglected. Our general impression, however, is that the need for connecting organizational factors and asset-accumulation processes is not a generally recognized one. The situation may be slowly changing³, but so far this literature has been silent on the role of corporate headquarters.

¹ Notably, Michael Porter (1996) has recently focused in on complementarity as a crucial concept in strategy thinking.

² The argument does not amount to the denial of the general possibility of obtaining sustained competitive advantages from tradeable inputs (cf. Barney, 1986); this is completely dependent upon specific assumptions with respect to the distribution of market power and information. Rather, the argument is the more subtle one that there is *in general* a greater *potential* for SCA associated with internally accumulated asset stocks than with tradeable resources, simply because there is no direct trading process here that promotes a tendency towards the equalization of supply and demand price on the relevant input market.

³ Not least due to the increasing importance of that stream of the resource-based approach that is explicitly inspired by C.K. Prahalad and Gary Hamel's landmark contribution on "The Core Competence of the Corporation" (1990). Here there clearly has been some attention paid to specific types of asset-accumulation processes, namely processes of competence development, and how these are best organized (e.g., Hamel and Heene, 1994; Heene and Sanchez, 1996).

II. CONCEPTS OF SYNERGY: A RESOURCE-BASED DISCUSSION

A. The Meanings of Synergy

Much research effort has been devoted to understanding what keeps divisionalized, multi-product firms together. Recent research exemplified by concepts such as "*dominant logic*" (Prahalad and Bettis, 1986), "*core competence*" (Prahalad and Hamel, 1990), "*organizational knowledge structures*" (Lyles and Schwenk, 1992) "*corporate coherence*" (Teece, Rumelt, Dosi and Winter, 1994), and "*parenting advantage*" (Goold, Campbell and Alexander, 1994) is representative of such attempts to rationalize divisionalized, multiproduct firms. Underlying all these notions is – implicitly or explicitly – a notion of synergy between businesses as an important rationale for the diversified corporation.

Synergy is a concept that is so fraught with different meanings that one is excused in thinking that it is better to avoid it completely in favor of more precise concepts. However, it is well-established in strategy thinking, and, more importantly, has a number of important connotations that are not fully captured by more narrow concepts, such as economies of scope. Moreover, the concept has been at the core of resource-based thinking at least since Edith Penrose's (1959) seminal contribution. More specifically, Penrose (1959) was concerned with two forms of synergy (she did not use the exact word, though) – namely what may be called *asset sharing*, which is brought about due to inevitable indivisibilities of resources, and *asset transfer*, particularly transfer of assets in excess (of which excess managerial resources interested Penrose the most). In an often-quoted contribution, Michael Porter (1987) contended that these are basically the only kinds of synergy available to firms. However, we argue that there is more to synergy than Porter's classification.

The perhaps dominant contemporary understanding of synergy revolves around the concept of economies of scope, which simply refers to what economists call a "sub-additivity" in the cost function. Thus, in the two-product (a and b) case, economies of scope exist when $C(a, b) < C(a) + C(b)$ (e.g. Teece, 1982). Of course, this is a purely formal definition and says nothing *per se* about the underlying factors or mechanisms that actually cause the sub-additivity in the cost-function. The normal presumption, however, is that economies of scope stem from some type of shared physical equipment. Thus, the concept is tied, if not by logic, then by usage, to given, physical assets – obviously a rather narrow interpretation. In order to put more flesh on the skeleton of synergy, let us briefly return to the contribution that actually introduced the concept to the strategy field, namely Ansoff (1965).

Ansoff defined synergy as a super-additivity in the return on investment function, such that (in the two-product case), $ROI(a, b) > ROI(a) + ROI(b)$. This is consistent with the notion of economies of scope in the sense that these may be underlying the sub-additivity in the re-

turn on investment function. However, clearly Ansoff's definition is broader, the obvious difference being that his understanding of synergy is concerned with more than the cost of production, even when production is defined in a broad sense. In other words, costs are only part of the equation ($ROI = (R - C/I)$). Whereas economies of scope are about the reduced costs of joint production (i.e. asset sharing) *vis à vis* separate production, synergies are also about increasing revenue and reducing the level of investment needed for expansion.

Although increased revenue may be the effect of economies of scope if (part of) the cost reduction is used to reduce selling prices, this will only be the case if the price elasticity of demand is sufficiently high to offset the lower price per product. Increased revenue through lower prices also requires that the economies of scope can be obtained without congestion since production volume has to be increased. Reducing the necessary level of investment in the introduction of new products can be obtained by sharing uncongested resources. However, economies of scope based on shared physical equipment or financial resources (as in Williamson's (1975) M-form hypothesis) will lead to congestion because these resources have fixed capacities, and firms cannot expand their stocks of such assets instantly (Dierickx and Cool, 1989).

Furthermore, economies of scope based on generic physical equipment or financial resources can be easily imitated by competitors, and will therefore only lead to short term advantages. If the assets are strategic⁴, sharing will lead to sustainable competitive advantage if the strategic assets have excess capacity. An example of such an *asset amortization advantage* (Markides and Williamson, 1994) is Black & Decker's portfolio of small electrical motors used in a variety of end products (Prahalad and Hamel, 1990). However, congestion is still likely to happen when the shared resources are either tangible or financial, while intangible resources have expandable capacity (Itami and Roehl, 1987). A special class of intangible resources are core competencies which among their defining characteristics have the potential to bring competitive advantage in multiple markets (Prahalad and Hamel, 1990). Markides and Williamson (1994) have described three ways of obtaining synergy from core competencies:

- *Asset improvement*: the potential to use a core competence accumulated in the course of building or maintaining a strategic asset in one business unit to help improve an existing strategic asset in another business unit. Unilever provides an example of a multibrand company that can utilize its skills and experiences acquired in the process of building new brandnames to help maintaining existing brandnames.

⁴ Strategic assets are defined as "assets that underpin a firm's cost or differentiation advantage in a particular market and are imperfectly imitable, imperfectly substitutable, and imperfectly tradable" (Markides and Williamson, 1996: 341).

- *Asset creation*: the potential to utilize a core competence developed through the experience of building strategic assets in existing businesses to create a new asset in a new business. An example would be the ability of Honda to utilize its competencies in establishing dealerships for its motorcycles to establish dealerships for its automobiles division.
- *Asset fission*: the potential for the process of related diversification to expand a corporation's existing pool of core competencies because, as it builds strategic assets in a new business, it will learn new skills that in turn will allow it to improve the existing assets in existing businesses. For instance, Canon may have acquired new skills in electronics, optics or manufacturing when it was building its laserprinter-business, which were also useful in improving performance of the photocopier-business.

Markides and Williamson (1994) thus introduce a more dynamic view of synergy than can be contained from the concept of economies of scope, a view that is concerned with the diversified corporation's advantages in asset accumulation processes relative to a specialized firm.

B. Synergy as Complementarities Between Assets

The attraction of using the concept of economies of scope to address the fuzzy concept of synergy obviously lies in its well-defined nature. However, there is another well-defined concept from economics that is broader and better captures, for example, Ansoff's understanding of synergy as referring to a property of the return on investment function. This is the concept of *complementarity* – a concept that has been seen as a key dimension of competitive advantage (Porter, 1996).

An example of complementarity may be a shared distribution network for complementary products, where the convenience (e.g. reduced search and negotiation costs or increased utility) for the customer in bundling his purchases gives him an incentive to buy from a single supplier rather than using multiple suppliers. The keywords here are "complementary products", because shared distribution of unrelated products might reduce costs due to economies of scope in handling the products or economies of scale in increased storage or display space. The complementarity (or fit) consist in the buyer's incentive to bundle his purchases because the products are interconnected in some way.

More complex forms of complementarity obtain when accumulating more of one stock of assets increases the returns from accumulating more of another stock of assets and *vice versa*

(Milgrom and Roberts, 1995).⁵ This form of synergy requires that asset stocks are mutually supporting, as when strong brand names are reinforced by R&D and manufacturing departments dedicated to maintaining product differentiation. Underlying this may be the phenomenon which Dierickx and Cool (1989) refer to as "asset-stock interconnectedness", that is, the accumulation of one stock (e.g., R&D knowledge) feeds on the accumulation of another stock (e.g., marketing knowledge) and *vice versa*. This may also be connected to Markides and Williamson's (1994) analysis, which shows that learning from the process of asset accumulation may ease the maintenance or improvement of other assets.

C. Synergy and Sustained Competitive Advantage

The concept of complementarity can thus enrich the concept of synergy. A further attraction is that complementarity links up with the issue of sustainability of competitive advantage. Dierickx and Cool (1989) isolated five mechanisms that influence the sustainability of competitive advantage, namely

- *Time compression diseconomies*, which exists when a given level of expenditure over a particular period of time produces a larger increment in asset stock than the same level over a shorter period of time. Crash R&D-programs undertaken to catch up with competitors will, in the absence of imitation opportunity, require more resources, than programs spread over longer periods of time.
- *Asset mass efficiencies*, which exists when adding to an existing asset stock is facilitated by possessing high levels of that stock. Thus gaining shelf-space or access to new distribution channels will be easier for an established company than for a newcomer, because they can demonstrate success of their products.
- *Asset stock erosion*, which occurs in the absence of adequate expenditure in maintaining the asset stock. With investments in long-lived, dedicated assets, a company can show its determination to stay in that business and deter entry from potential competitors.

⁵ This definition, like Milgrom and Robert's original notion of complementarity, may seem somewhat narrow because of the symmetry requirement: "Note that complementarity is symmetric: If doing more of activity **a** raises the value of increases in activity **b**, then increasing **b** also raises the value of increasing **a**" (Milgrom and Roberts 1995: 183). Depending on the definition of symmetry, this could be taken to mean that the increases in value have to be numerically similar, if certain activities were to be termed complementary. This seems to be a too narrow conception of the complementarity effect for practical purposes. It also eliminates the possible substitution of the synergy concept for the complementarity concept, since synergy is not conditioned on symmetry. Of the four kinds of synergy mentioned by Markides and Williamson only asset amortization can be said to imply symmetry, while the others – asset improvement, asset creation and asset fission doesn't, because utilizing the capabilities obtained from developing an asset in one business unit to build or improve an asset in another business unit doesn't enhance the original asset. Thus increasing the stock of asset **b** does not increase the value of increasing the stock of asset **a**, although it may strengthen the asset-improving or asset-building capability through learning and amortize the costs of developing that capability.

- *Asset stock interconnectedness*, which exists when adding to an existing asset stock depends not just on the level of that stock, but also on the level of other stocks. A servicenetwork may facilitate new product development by granting access to consumer experiences and wishes. Likewise, a service-network may be a condition for building a reputation for high quality.
- *Causal ambiguity*, which exists when it is impossible to identify or control the variables leading to the accumulation of the assets. The success of the Sony walkman may be attributed a wide variety of causes, such as the insight of Akio Morita, the concurrent inside development of both earphones and portable tape-recorders, Sony's dealer-network being able to provide fast feedback on consumer reactions and preferences etc. The large number of possible, and possibly intertwined, causes of success makes it difficult for competitors to know which asset stocks to imitate in order to erode Sony's competitive advantage in product innovation.

It is our contention here that time compression diseconomies, asset mass efficiencies and asset stock interconnectedness are different manifestations of complementarities/synergies. Moreover, none of them would seem to be adequately described by the concept of economies of scope.

The preceding discussion also implies that although synergy has usually been discussed in connection with diversification studies and corporate strategy more generally, it is also important in connection with competitive strategy.⁶ Thus, one way of earning rents (i.e., achieving competitive advantage) is through generating and exploiting synergies between the different assets and activities of the firm. This is because synergies by definition implies a more efficient use of resources compared to non-synergistic use of the same resources. Such an advantage in efficiency, however, can only be *sustainable* if imitability of the synergistic activities is impaired by the above mechanisms, for example, time compression diseconomies (e.g., due to the longevity of cooperative relationships between business units) or asset stock interconnectedness and causal ambiguities (due to the diversity of the assets involved and the complexity of the ways in which they link).

Application of the resource-based approach (Barney, 1986, 1991; Grant, 1991; Peteraf, 1993) implies that gaining competitive advantage through synergy-exploitation requires that the relevant assets are

⁶ In general, the resource-based literature has been characterized by a rather strict dichotomization of research themes: there is research in the conditions of sustained competitive advantage (e.g., Barney, 1991; Peteraf, 1993), and there is research in efficient diversification (e.g., Rumelt, 1974). While this partitioning of research themes may be convenient, the two themes are in reality very closely intertwined (Wernerfelt, 1984; Montgomery and Wernerfelt, 1988; Markides and Williamson, 1994; Christensen and Foss, 1996).

- *valuable* in the intended applications;
- *rare* and *inimitable*, that is, inaccessible for competitors on all the relevant markets;
- the asset is very hard for competitors to *substitute*;
- the asset must have *limited tradeability*, that is, the costs to selling excess capacity outside the firm must exceed the costs of internal transfer, or otherwise the firm will be better off selling excess capacity to other firms and avoiding the costs of coordinating internal sharing or transfer.

D. Merging the Concepts

To sum up, there are several competing concepts describing the possible benefits of a diversified corporation possessing a coherent portfolio of assets relative to a more specialized firm. The above discussion has demonstrated some of the differences and similarities between the partially overlapping concepts of synergy, economies of scope and complementarity. The major similarity between the concepts is that they all, in part, can be explained by the possibility of joint production in certain processes.

Joint production does not, however, explain all of the benefits to the diversified corporation. The concept of economies of scope includes other forms of sharing of mutual assets which are not cases of joint production, but is itself not a sufficient explanation for the synergy effect, since the concept of synergy is broader. The most important limitation to Ansoff's (1965) concept of synergy is that it does not encompass complementarities between investments and activities that are sequential in time or order of execution. These effects are covered in the concept of complementarity, where complementarity over time obtains when "...investments at different points in time are mutually complementary, so higher early investments increase the pace of later investments" (Milgrom and Roberts, 1995: 187).

We think that it is both possible and necessary to merge these competing concepts, which differ in important respects. The following taxonomy captures, we believe, the various notions of synergies that we have discussed:

- *Horizontal synergies* – where the relevant synergies arise between related businesses that performs activities based on assets that are either shared or where the accumulation of assets in the businesses is a reinforcing process. This category includes both economies of scope and complementarities.
- *Vertical synergies* – where the relevant synergies arise within a single line of business as synergies between complementary activities.
- *Timing synergies* – where the relevant synergies arise as a result of future investments benefiting from past investments, that is, intertemporal complementarities are involved.

We will later further illustrate and discuss these different types of synergies in the context of some case vignettes; for the moment, however, we will be more concerned with the issue of how these different synergies are organized. We cannot expect them to simply emerge. Thus, we here take the position that synergies can be created, that processes of synergy creation have to be sponsored and coordinated, and that the CHQ has a crucial role to play here.

III. THE CORPORATE HEADQUARTERS AS SPONSORS OF SYNERGIES

A. Corporate Headquarters in the Literature

Diversified, divisionalized companies consist of businesses, which could conceptually exist as separate legal entities, and of a corporate hierarchy of line managers and staff outside these businesses, here called *the corporate headquarters* (CHQ). Generally, the CHQ includes functions that coordinate activities across business units. We here follow Chandler (1994) in thinking of the CHQ as also including top-management.

Apart from the theoretically trivial role of meeting statutory obligations, what essentially is the role of the CHQ? This question would seem to have become increasingly topical, as restructuring of CHQ has become an important managerial concern. The conventional answer to the question is that the CHQ undertakes basically two overall functions. The first is that it undertakes long-run strategic planning; the second one is that it engages in more administrative or loss-preventing functions, such as monitoring the performance of individual divisions (Chandler, 1994: 327). More specifically, the CHQ determines corporate strategy, and steer the implementation and carrying out of corporate strategy by influencing managers in business units, by making choices among investment opportunities and by acquiring and divesting businesses in the horizontal and vertical dimensions. Moreover, the CHQ determines organizational structure, carry out financial control, and determine hurdle rates.

Implicit in these answers is that the CHQ function creates value – and in fact exists on account of this (Foss, 1997). But how specifically is value created? One possible, but somewhat awkward, answer turning on the second main task of the CHQ is that it creates value by preventing loss. That is to say, the CHQ's function and rationale lie in some superior ability to avoid losses. In a sense, this a *negative* view of the function and rationale of the CHQ: they exist because they *hinder* something, such as morally hazardous behavior (Holmström, 1982; Miller, 1992).

Another answer – more in the *positive* vein – is that the CHQ's function and rationale may rather turn on its ability to create value through its strategic leadership. This is here taken to imply more than setting the overall goals for corporate activities. Specifically, exercising strategic leadership is here taken to include engaging in such diverse value-creating activities

as seeing to that economies of scope are exploited, reshuffling assets across divisions and functions, the building of teams, imbuing employees with a corporate ethos, transferring knowledge, furthering organizational learning in other ways, etc.

This is a large number of tasks, and for the sake of the clarity of the discussion, we need to provide a more narrow menu of what it is that the CHQ may accomplish. Luckily such a menu has been provided already. According to Campbell, Goold and Alexander (1994: 78), there are four basic ways in which the CHQ may create value through its ability to effect various types of influences on the divisions/strategic business units. These are: Stand-alone influence, linkage influence, functional and services influence, and corporate development activities. We define and exemplify these in the following.

Stand-alone influence refers to the situation in which the parent enhances the stand-alone performance of the business units. Examples from Campbell et al. (1994) include the company Dover, which exerts stand alone influence through appointing senior managers; BTR, which emphasizes budgetary control; Emerson, which uses its strategy review process to create value; and RTZ, which brings value through infrequent, but large capital investments in its mining businesses.

Linkage influence obtains when the parent enhances the value of linkages between the business units. This type of influence spans several different approaches ranging from encouraging, but not demanding, cooperation between autonomous businesses to developing elaborate network/matrix structures and centralized pools of resources drawn from and added to by individual businesses. Thus the mechanisms used to generate this kind of influence range from transfer of best practices between individual units as in the bank holding company Banc One to the more elaborate building of cross-product group linkages in Unilever through building networks and lateral relationships between managers in different businesses, by retaining tight control over career management and promotion decisions and by influencing strategy development. Examples of the network/matrix structure way of exerting linkage influence are the way that ABB and Hewlett Packard have arranged for each profit center to be part of both a regional/geographical company and a global business area structure.

Under *functional and services influence* the parent provides functional leadership and cost effective services for the business units. In 3M a central technical function helps identifying and developing technical directors and managing an audit process for the company's 150 laboratories. Likewise, The Royal Dutch/Shell Group have central functions ranging from finance, legal, human resources and research, to its famous scenario planning unit who pioneered this approach.

Finally, through *corporate development activities* the CHQ creates value by altering the composition of the portfolio of business units. This can be achieved by combining smaller

companies into a larger unit achieving economies of scale/scope as GE does in its strategy of making each of its businesses one the largest in its industry, or by splitting businesses to achieve greater focus as done by ABB and BTR. Adding new business areas to exploit excess capacities can be achieved by the CHQ through corporate product-development departments or by combining hitherto autonomous product areas to produce integrated products. Included in corporate development activities are assistance in the process of acquisition and divestment of businesses as successfully done by Hanson Trust.

Clearly, these modes of influence relate to our previous discussion of synergies. They describe the processes through which the CHQ may stimulate synergies. For example, linkage influence means stimulating latent economies of scope or complementarities.

B. Promoting Horizontal, Vertical and Timing Synergies Through CHQ Activities

Based on the discussion in section two we suggested a three-dimensional taxonomy for analyzing opportunities for synergy. Specifically, we distinguish between horizontal, vertical and timing synergies. In this section we illustrate the distinction between horizontal, vertical and timing synergies, and discuss how the CHQ in two large Danish industrial companies, Danfoss and Bang & Olufsen, were instrumental in creating these synergies.⁷

Danfoss is a world-leading manufacturer of certain types of hydraulics, intelligent refrigeration systems, radiator thermostats and compressors and thermostats for refrigerators. The company employs about 17,000 people worldwide and has a turnover of about 2 billion US\$. Danfoss has adopted an M-form organization structure with ten product-divisions divided between three "product-families" (groups of divisions). Danfoss has an extensive network of coordination committees, a comprehensive on-line database of standards/policies covering many aspects of day-to-day operations, and some CHQ-involvement in the strategy-planning process of the divisions.

In the present paper, *Bang & Olufsen* refers to the audio-visual division of Bang & Olufsen Holding Ltd., which accounts for approximately 90% of the corporation's annual turnover. This division is a consumer-electronics company with about 2.500 employees and an annual turnover of about 0.5 billion US\$. Bang & Olufsen is mostly known for the aesthetic design of its audio-visual-products,⁸ although Bang & Olufsen has also introduced many technical innovations.⁹ Bang & Olufsen is a U-form organization organized in three departments:

⁷ It is partly based on Iversen and Christensen (1996a&b).

⁸ Of which several are on permanent display at the Museum of Modern Art in New York.

⁹ Among their most notable technical innovations stand the worlds first transistorized amplifier, the worlds first stereo pick-up and, more recently, the invention of HX Professional, which have become standard in Dolby™ noise reduction systems.

Operations, Business Development and Sales/marketing. Bang & Olufsen Holding Ltd. is mostly a holding company (H-form) type of organization with very limited CHQ intervention and the audio-visual division assuming the role of parent to the other four subsidiaries/affiliates of the holding company¹⁰.

A. Horizontal synergies

The first type of synergy, called *horizontal synergies*, obtains between parallel activities in different business units (e.g. between distribution of product *a* and distribution of product *b*). This kind of synergy has received the widest attention in the economics literature, namely under the rubric of economies of scope and usually refer to shared physical resources like machines, tools, buildings and other fixed, indivisible investments. Other examples include a shared salesforce or sharing administrative functions like accounting and human resource management.

Recent literature has introduced the concepts of core products (Prahalad and Hamel, 1990) and product platforms (Meyer and Utterback, 1992) which are physical and technological resources that can be shared between different end-products. Although these examples are among the opportunities for synergy that are arguably easiest to recognize, they also seems the hardest to sustain because they apparently reduce the firm's sourcing and operating flexibility more than the sharing of competencies, because changes on behalf of one internal customer might be resisted by the others (Mahajan and Wind, 1988; Prahalad and Doz, 1992). In other words the outputs of shared activities becomes the least common denominator of the requirements of the units sharing the activity.

Some horizontal synergies are similar to the benefits of what Campbell et al. (1994) call *linkage influence*. The CHQ promotes this kind of synergy through the design of its sourcing policies, transfer pricing mechanisms, cross-unit task forces, reward and recognition systems, staff rotation, central policies or guidelines, arbitration processes, central experts, and fora to encourage information sharing and straightforward information exchanges. Porter (1985: 394) divides the mechanisms for achieving horizontal synergies into four broad categories:

1. Horizontal *structures*, which are organizational devices that cut across business, such as grouping of business units, partial centralization, interdivisional task forces and committees.
2. Horizontal *systems*. Management systems with a cross business unit dimension in areas such as planning, control, incentives and capital budgeting.

¹⁰ The subsidiaries/affiliates include Bang & Olufsen Technology (medical utensils), Bang & Olufsen Telecom (telephones), Ericsson DiAx (telephone switchboards), and Beologic (computer-software).

3. Horizontal *human resource practices* that facilitate business unit cooperation such as cross business unit job rotation, and corporate management fora and training programs.
4. Horizontal *conflict resolution processes*.

The difficulty in sustaining horizontal synergies may be illustrated by the experiences of Danfoss and Bang & Olufsen, both of which have plants that manufacture and supply components to different product lines. In recent years the strategies of both companies have been to out-source components to outside suppliers, except those that differentiate their products from the competitors.

Danfoss has furthermore also decentralized the manufacture of components so that each of the ten product divisions produce more of their own components and fewer are procured from the centralized plants. Likewise Danfoss' central procurement department was decentralized in 1988 and the divisions assumed responsibility for their own purchases. In the beginning of 1997, all manufacture of components has been transferred to the product divisions.

In 1988 Bang & Olufsen formed a subsidiary, Bang & Olufsen Technology¹¹, that was meant to develop and manufacture new products on behalf of other companies. The new company was expected to utilize the parent company's resources in manufacturing and R&D when they were in excess, typically because of seasonal changes in the demand for the parent company's audiovisual products. This idea was soon abandoned because of coordination problems (e.g., priority of access to resources) and the new company got its own staff and facilities. Today, Bang & Olufsen Technology primarily benefit from its relations to Bang & Olufsen through sharing their purchasing network and the company's reputation.

Other kinds of horizontal synergy are the types of synergy described by Markides and Williamson (1994) (as summarized in section IIA), which Danfoss tries to obtain by inventing new coordination mechanisms. One such mechanism is what is called in the firm "the technology pyramid", which describes the competencies, skills and technologies that are in corporate-wide use. A gatekeeper is assigned to each one of these competencies, skills and technologies. He is responsible for the development of the relevant assets, for surveying developments by other companies and research institutions, and for cooperating with other companies and research institutions in the technological field to which the relevant assets belong. The work of the gatekeeper is monitored by a committee with members from different divisions.

In Bang & Olufsen, the amortization of technological competencies is accomplished by adopting a so-called network-organization in the R&D department, where the technicians and engineers work on various projects based on their technical – rather than product – area of

¹¹ Now a subsidiary of Bang & Olufsen Holding Ltd.

expertise. In this way an expert in the design of loudspeakers can work on developing both separate loudspeakers and speakers for use in televisions, telephones or portable equipment and thereby increase his or her specialization to the benefit of different product lines that can share that person's skill. An example is the development of the Beosystem 2500 which was the first integrated integrated stereosystem that employed "active" loudspeakers¹². This development of competency in active loudspeaker technology subsequently led to the development of a whole range of active loudspeakers and the technology was also used in television sets.

Danfoss also realize synergy by having complementary product lines like valves, thermostats and compressors which are all targeted at producers of refrigerators. Danfoss' two sales divisions are independent from the product divisions so they can combine products from them with complementary products from other companies and resell these products along with products manufactured by Danfoss.¹³ In fact, a key part of Danfoss' strategy is to develop complementary products and acquire companies whose products are complementary to the existing product lines. Thus, Danfoss has also formed so-called "product families" (groups of divisions), which is a new hierarchical layer designed to develop business areas that fill the gaps between the existing product/market areas of the divisions.

Bang & Olufsen also achieves this kind of synergy by developing products that work as integrated systems. For instance, their remote controls can control both audio and video products, so only one remote control to use the TV, VCR and stereo system is needed (provided all of them are Bang & Olufsen-products). Likewise the fact that customers can buy a full system of Bang & Olufsen-products may increase the customer's perceived value of the individual products because of the aesthetic and functional connectedness between the products. Systems integration is coordinated by a designated technology chief with responsibility for product compatibility.

B. Vertical synergies

The second type of synergy, *vertical synergy*, consists of synergies between complementary assets contributing to a single line of business. These are either synergies between sequential or successive activities, or synergies between competencies that contribute to the same activity. When all the relevant assets for achieving vertical synergy is under the control of divisional management, the role of CHQ must be to provide strong incentives for their efficient utiliza-

¹² Active loudspeaker are loudspeakers with separate amplifiers for each of their drive units, for example, bass and treble.

¹³ The sales subsidiaries are not allowed to sell the products from outside supplier under the Danfoss brand and the products have to live up to Danfoss' quality standards.

tion. In other situations, complementary assets also has to be shared with other divisions, and their use must therefore be coordinated by the CHQ (we explain this point later).

Both *stand-alone influence* and *functional and services influence* in the terminology of Campbell et al. (1994) can assist in the creation of vertical synergies. For example, the CHQ may develop and diffuse different techniques which increase operational efficiency through the training of SBU-managers and through establishing advisement groups. The CHQ also exert influence on divisions by imposing centrally developed methods and procedures in, for example, budgeting and financial reporting. The role of the CHQ in appointing the general manager and their influence on management development and succession planning also affect divisional strategies, as do the ways in which CHQ approve or reject budgets, strategic plans and capital expenditure proposals or influence the shape and implementation hereof.

Bang & Olufsen's success in creating an audio-visual products with an appealing aesthetic design is the result of vertical synergy between product development activities. It is not just the result of a superior aesthetic design capability; in fact, the aesthetic design of their products are made by independent designers. Bang & Olufsen themselves ascribe the success of their products to the combination of six complementary competencies:

- A superior capability in developing the electronic circuitry to fit the designers ideas.
- Competencies in materials technology and mechanics (especially product surfaces).
- A competence in developing systems with high quality in sound reproduction based on insights in psychoacoustics and a specially trained group of listeners (internal lead users).
- A competence in developing systems with high quality in image reproduction based on research in quality attributes in image reproduction and a specially trained group of viewers (internal lead users).
- A functional application competence in developing new ways of operating the products.
- A competence in developing integrated systems that works in different rooms in the home (link-systems).

The *combination* of these *complementary* competencies helps Bang & Olufsen to create products that are perceived as unique by most people; it is fundamentally what gives the firm its differentiation advantage. It is achieved through cross-functional work-groups in the concept-development stage of new product development. The members of these groups come from the manufacturing, marketing and business development departments and meet to assure that suggestions for new products meet the requirements for manufacturing and marketing before entering the development stage.

In the beginning of the 1990s, Bang & Olufsen developed a new strategy named "Break Point 93" making the year 1993 a turning point after years of unsatisfactory financial performance. This new strategy for Bang & Olufsen contained three complementary key objectives. The first objective was to reduce the fixed costs in order to eliminate the losses sustained when demand is low due to cyclical fluctuations. This was accomplished through out-sourcing the manufacturing of non-critical components and developing a leaner organization with fewer hierarchical layers and delegating responsibility to 125 newly created autonomous work-groups. The second objective was to create more so-called "breakthrough"-products which were ahead of competitor's products on a number of selected criteria. This was accomplished through a reorganization of the product development department leading to the concept of the "network organization" previously described and a new product strategy involving a broader product portfolio with fewer variants of the individual products.

The third objective was to improve the quality of the distribution which was accomplished by improving logistics through the use of EDI (Electronic Data Interchange), connecting both suppliers and retailers to the computer systems at Bang & Olufsen. Bang & Olufsen also conducted a screening of retailers, which resulted in the "dismissal" of more than 700 retailers. The 2.400 remaining and new retailers are offered training by Bang & Olufsen, who also provides special concepts for displaying their products.

The complementarities between these activities undertaken to fulfill the three objectives have given Bang & Olufsen three consecutive years of record-breaking profits and turned Bang & Olufsen into one of the world's most successful manufacturers of consumer electronics.

It may be doubted whether fulfilling any of these objectives in isolation would have created equally remarkable results, since the creation of more "breakthrough"-products made it more desirable for the retailers to carry Bang & Olufsen-products, which put Bang & Olufsen in the position of being able to make higher demands on the retailers. Likewise, the reduction in fixed costs made it possible for Bang & Olufsen to be profitable, even if the reduction in the number of retailers had made the revenue fall. The leaner organization made possible by the changed product strategy of fewer product variants and closer cooperation with suppliers and dealers gave Bang & Olufsen the ability to offer products at competitive prices despite significant scale disadvantages compared to their much bigger competitors like Sony, Philips and Matsushita.¹⁴ This would not have been achieved without increased mutual adjustment made possible by department heads being members of the board of directors and thus part of the

¹⁴ The market for consumer electronics is very price sensitive, which means that even companies with a differentiation advantage such as Bang & Olufsen can only obtain a modest premium on their products compared to products with the same basic specifications such as screensize on TV's and maximum power rating on amplifiers.

team developing and agreeing on the "Break Point 93"-plan. On the tactical level, the cross-functional work-groups in product-concept development assure that the demands of all departments are met.

C. Timing synergies

Finally, we see a third dimension consisting of synergies between activities that are carried out at different points in time, but are mutually beneficial because the later activities exploits learning from past activities. Some of these *timing synergies* have the properties of *real options* (Sanchez, 1993) because divisions have the opportunity, but not the obligation, to further develop the assets of the corporate center to fit the needs of their own businesses. Business units may for instance defer investing in new technologies if the technologies are being monitored by a central R&D-lab which can transfer experts and patent rights to any unit which might require it. Likewise, central functions can provide extra manpower to business unit projects during emergencies.

Having a pool of deployable resources for unforeseen contingencies is an important advantage for the multi-product firm because the costs can be amortized between all business units instead of being carried by the single business area of the specialized firm. In Milgrom and Robert's view (1992: 107) core competencies are a sort of shared input to products that does not yet exist, and thus constitutes a timing synergy. Most other durable investments, both physical and intangible, whose duration exceeds the life span of the corporation's individual products are a source of timing synergy if they bring more value to the products than generic inputs.

Thus, the CHQ may, through its central staff, ease the entry into new markets by undertaking market and technological research that can be used by different divisions. The existence of time compression diseconomies (Dierickx and Cool, 1989) implies that the CHQ may avoid destroying value by relaxing rigorous control systems and providing guarantees for adequate funding of long-term projects. Corporate development activities which reshuffles the composition of businesses may also be a source of timing synergy by rejuvenating mature divisions through allocation of ventures developed elsewhere and/or refocusing cluttered divisions by removing responsibility for new ventures which are unrelated to existing activities (Galunic and Eisenhardt, 1996).

Like most diversified corporations, Danfoss has a central research organization called Corporate Technology and Research (CTR). CTR conducts projects with a time horizon of 4–5 years that can either be directly used in one or more of the ten product divisions or provide options for new ventures. The results of the research projects are diffused throughout the entire organization through direct contacts and a variety of committees and technology councils.

When a new venture project has reached a mature state, it has to be transferred to a division that is willing to assume responsibility for developing the venture. Bang & Olufsen also provide options for assessing technologies for the other subsidiaries in the holding company through their research and their contacts with suppliers.

Another type of timing synergy is evident in Bang & Olufsen, where the development department has conducted a series of consecutive development programs to enhance the effectiveness and efficiency of the organization. They started with creating the basic premises for the network organization by dividing the departments management responsibilities between managers of product development projects and managers of technology development projects. The following development programs consisted of developing a project-oriented organization, eliminating one of the hierarchical layers, substituting the product-based departments with departments based on technological competencies. These programs were followed by a program focusing on increasing the hit-rate of development projects by introducing a series of measurement-techniques, which led to an improvement in for instance the rate of projects completed on-time from 10% to 90%.

The next program reduced the number of customer complaints to 1/8 of the previous level through focusing on improving product quality. After that, the development department conducted programs identifying and strengthening their key competencies, a program leading to ISO9001-certification and a Business Process Reengineering-program that reduced the length of the average development project from 127 weeks to 72 weeks. The latest programs are concerned with mapping of product-technologies, increasing the ability to adopt new technologies and developing a five-year plan for the product-development activities.

These consecutive projects are complementary because they add to and complement the skills developed in previous programs and thus provides a continuous and incremental enhancement of the competencies of the development department. The programs are probably also associated with time compression diseconomies (Dierickx and Cool, 1989), which makes it difficult for competitors to catch up.

V. CONCLUDING DISCUSSION

Our primary aim in this paper has been to help placing the issue of how the CHQ may initiate and coordinate processes of synergy creation on the agenda of strategy researchers. We have not provided a finely honed theory; rather, we have put forward a number of concepts and (hopefully) clarifying discussions, and indicated how a number of hitherto independently developing literatures may make contact. Our framework may be illustrated as in figure 1.

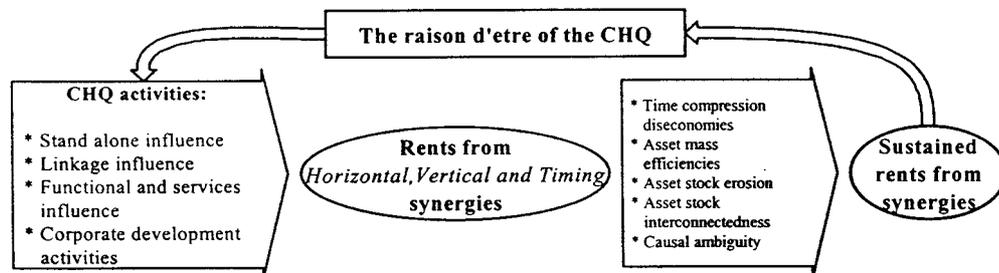


Figure 1

The main point of the figure is that the CHQ through various activities may create synergies that translate into rents. To the extent that these rents are hard to imitate, they translate into sustained rents. It is the ability to generate such rents that we argue is the primary *raison d'etre* of the CHQ.

However, we have left many issues open. Specifically, our main issue, the role of the CHQ in fostering synergies, requires much more research. Our own examples suggest that the CHQ primarily promotes synergy by mandating communication and mutual adaptation across departmental boundaries at all levels of an organisation. Sometimes special structures have to be invented as in the cases of the network-organization in Bang & Olufsen or the Technology Pyramid and Product Families of Danfoss.

While we believe our discussion has raised pertinent issues and have given some (albeit tentative) answers, it may be criticized in many ways. For example, it may be read as a ringing endorsement of strong and detailed top-down direction on the part of top-management. This is clearly at variance with much contemporary thinking on the learning organization, team and project organization, bottom-up perspectives, and much else. We do not believe our discussion necessarily implies a naïve endorsement of top-down management. However, while synergies may be imagined to develop spontaneously, we maintain that this is not generally the case and that involvement on the part of the CHQ will normally be necessary as demonstrated by our examples.

Coordination by the CHQ will for instance be necessary when the benefits of cooperation is unevenly distributed between cooperating business units and especially when achieving benefit for the whole corporation involves loss of opportunity and/or autonomy or even increased costs for individual divisions. Also, decentralized decision-making work poorly to the extent that the optimal resource allocation significantly depends on the use of knowledge that is not given to lower-level personnel (such as business unit managers) (Milgrom and Roberts, 1992: 92). Organizational restructuring, new product launches, the stimulation of inter-divisional

knowledge flows, etc. are examples of design problems with an *innovation attribute* (ibid.). These problems favor intensive knowledge flows and some extent of centralized control.

Another critique is that we have not paid attention to incentive issues. This is certainly a justified critique, and future work will take this into account. The pertinence of the critique becomes clear when it is realized that creating, for example, horizontal synergies amounts to making the firm more team-like.¹⁵ And since Alchian and Demsetz (1972) and Holmström (1982), we have known that team-production is a potential cover for shirking. Per implication, fostering horizontal synergies may mean that monitoring becomes less effective, since it becomes increasingly difficult to ascertain the contributions of individual team-members, for example, divisional managers. Thus, the cost of obtaining additional synergies may be additional agency costs. The demands which the different types of synergy poses on CHQ appear to be conflicting when considering the incentive effects because horizontal synergies may require extensive CHQ involvement in the operating decisions of divisions, while timing synergies require more extensive divisional autonomy with CHQ-support for long-term projects and less emphasis on tight financial control. Tight financial control on the other hand put strong pressure on divisions to maximize the efficiency and thus promotes vertical synergies but is incommensurable with horizontal synergies because resource sharing complicates the measurement of divisional performance.

Finally, we do not believe that synergies should be pursued at all costs. Achieving synergy is costly for at least two important reasons. First, cooperation has to cross borders between organizational subunits, which creates incentive and informational problems. Second, creating synergies induces complexity because synergy is not just about long-term cooperation between fixed units/partners. Instead synergy implies changing patterns of heuristics (capabilities, routines) in identifying and establishing opportunities for synergistic cooperation. Therefore, a strategy of synergy-pursuit require careful selection of the activities and assets on which the synergies are based in order to avoid the benefits being eroded by the cost of cooperation. These costs of coordination may include both costs of search, administration and mutual adaptation, and opportunity costs due to the loss of entrepreneurial and operating flexibility inherent in trying to exploit existing resources rather than acquiring new ones for a specific purpose. Therefore we contend that exploitation of synergies should be based on the assets and

¹⁵ Technically, team-production is production with non-separable production functions. A result of team-production is that it is hard, perhaps even impossible, to tell the marginal product of each team-member. All that can (easily) be observed is team-output, and remuneration of agents have to be on the basis of the size of their joint output. This creates incentive problems, since the effects of reduced effort will be distributed throughout the team. The solution to this incentive problem is to appoint an employee to monitor team-production. Moreover, in order to provide incentives for efficient monitoring, the monitor should be given title to residual profit streams.

activities that are actual or potential sources of sustained competitive advantage. In other words, achieving synergy requires identification of imperfectly imitable and imperfectly substitutable activities and assets (cf. Barney, 1991, Dierickx and Cool, 1989) with sufficient flexibility for valuable application in more than one domain. ■

REFERENCES

- ALCHIAN, ARMEN A. and HAROLD DEMSETZ** (1972). "Production, Information Costs, and Economic Organization", in Armen A. Alchian (1977), *Economic Forces at Work*. Indianapolis: Liberty Press.
- ANSOFF, H. IGOR** (1965). *Corporate Strategy* New York: McGraw-Hill
- BARNEY, JAY B.** (1991). "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, 17, 99–120.
- CAMPBELL, ANDREW, MICHAEL GOOLD, and MARCUS ALEXANDER** (1995). "Corporate Strategy: The Quest for Parenting Advantage", *Harvard Business Review*, 73(2), 120–132.
- CAMPBELL, ANDREW, MICHAEL GOOLD, and MARCUS ALEXANDER** (1994). *Corporate-Level Strategy: Creating Value in the Multibusiness Company*. New York: John Wiley and Sons Inc.
- CHANDLER, ALFRED D.** (1962). *Strategy and Structure*. Cambridge: MIT Press.
- CHANDLER, ALFRED D.** (1990). *Scale and Scope*. Cambridge: MIT Press.
- CHANDLER, ALFRED D.** (1994). *The Functions of the HQ Unit in the Multibusiness Firm*. In Rumelt, Schendel and Teece (eds.) *Fundamental Issues in Strategy*. Harvard Business School Press, Boston Mass.
- CHATTERJEE, SAYAN and BIRGER WERNERFELT** (1991). "The Link Between Resources and Type of Diversification: Theory and Evidence", *Strategic Management Journal*, 13, 33–48.
- CHRISTENSEN, JENS FRØSLEV and NICOLAI J. FOSS** (1996). "Dynamic Corporate Coherence and Competence-Based Competition: Theoretical Foundations and Strategic Implications", forthcoming in Aïmé Heene & Ron Sanchez (eds.) (1996). *Competence-Based Strategic Management*, Oxford: Elsevier.
- DIERICKX, INGEMAR and KAREL COOL** (1989). "Asset Stock Accumulation and Sustainability of Competitive Advantage", *Management Science*, 35, 1504–1511.
- DOZ, YVES** (1995). "Managing Core Competency for Corporate Renewal: Towards a Managerial Theory of Core Competences", *Working paper*, INSEAD.
- FERLIE, EWAN and ANDREW PETTIGREW.** 1996. "The Nature and Transformation of Corporate Headquarters: A Review of Recent Literatures and a Research Agenda", *Journal of Management Studies*, 33, 496–523.
- FOSS, NICOLAI J.** (1997). "On the Rationales of Corporate Headquarters", *Industrial and Corporate Change*, 6, 313–338.
- GALUNIC D. CHARLES and KATHLEEN M. EISENHARDT** (1996). *The Evolution of Intracorporate Domains: Divisional Charter Losses in High-technology, Multidivisional Corporations*. *Organization Science*/Vol. 7, No. 3, May–June, 255–282.
- GHEMAWAT, PANKAJ and J.E. RICART I COSTA** (1993). "The Organizational Tension between Static and Dynamic Efficiency", *Strategic Management Journal*, 14, 59–73.
- GOOLD, MICHAEL and ANDREW CAMPBELL** (1987). *Strategies and Styles*. Oxford: Basil Blackwell.
- GRANT, ROBERT M.** (1991). "The Resource-Based Theory of Competitive Advantage", *California Management Review*, 33,
- HAMEL, GARY and AIMÉ HEENE** (1994). *Competence-Based Competition*. Wiley, Chichester.
- HOLMSTRÖM, BENGT** (1982). "Moral Hazard in Teams", *Bell Journal of Economics*, 13, 324–340.
- ITAMI, HIROYUKI and THOMAS W. ROEHL** (1987). *Mobilizing invisible assets*. Harvard University Press, Cambridge, Mass.
- IVERSEN, MIKAEL and JENS FRØSLEV CHRISTENSEN** (1996). *Bang og Olufsen: Strategi, Struktur og Teknologiledelse*. (in Danish), *Cistema Working Paper 1996–4*, Copenhagen Business School.
- IVERSEN, MIKAEL and JENS FRØSLEV CHRISTENSEN** (1996 b). *Danfoss: Strategi, Struktur og Teknologiledelse*. (in Danish), *Cistema Working Paper 1996–5*, Copenhagen Business School.

- LEVINTHAL, DANIEL A. and JAMES G. MARCH (1993). "The Myopia of Learning", *Strategic Management Journal*, 14, 95–112.
- LYLES, MARJORIE A. and CHARLES R. SCHWENK. 1992. "Top Management, Strategy, and Organizational Knowledge Structures", *Journal of Management Studies*, 29, 155–174.
- MAHAJAN, VIJAY and YORAM WIND (1988). "Business synergy Does Not Always Pay Off", *Long Range Planning*, 21, 59–65
- MARCH, JAMES G. (1991). "Exploration and Exploitation in Organizational Learning", *Organization Science*, 2, 71–87.
- MARKIDES, CONSTANTINOS C. and PETER J. WILLIAMSON (1994). "Related Diversification, Core Competences and Corporate Performance", *Strategic Management Journal*, 15 (Special Issue), 149–166.
- MARKIDES, CONSTANTINOS C. and PETER J. WILLIAMSON (1996). "Corporate Diversification and Organizational Structure: A Resource-Based View", *Academy of Management Journal* Vol. 39, No. 2, 340–367
- MEYER, MARC H. & JAMES M. UTTERBACK (1993). "The Product Family and the Dynamics of Core Capability", *Sloan Management Review*, 34,
- MILLER, GARY J. (1992). *Managerial Dilemmas: The Political Economy of Hierarchy*, Cambridge University Press, Cambridge.
- MILGROM, PAUL and JOHN ROBERTS (1990). "The Economics of Modern Manufacturing: Technology, Strategy and Organization," *American Economic Review*, 80, 511–528.
- MILGROM, PAUL and JOHN ROBERTS (1992). *Economics, Organization, and Management*. Prentice-Hall International, Englewood Cliffs.
- MILGROM, PAUL and JOHN ROBERTS (1995). "Complementarities and Fit: Strategy, Structure, and Organizational Change in Manufacturing", *Journal of Accounting and Economics*, 19, 178–208.
- MONTGOMERY, CYNTHIA A. and BIRGER WERNERFELT (1988). "Diversification, Ricardian Rents, and Tobin's q", *RAND Journal of Economics*, 19, 623–632.
- NELSON, RICHARD R. and SIDNEY G. WINTER (1982). *An Evolutionary Theory of Economic Change*. The Belknap Press, Cambridge, Mass.
- PENROSE, EDITH T. (1959). *The Theory of the Growth of the Firm*. Oxford University Press, Oxford.
- PETERAF, MARGARET A. (1993). "The Cornerstones of Competitive Advantage", *Strategic Management Journal*, 14, 179–191.
- PORTER, MICHAEL E. (1985). *Competitive Advantage*. New York: Free Press.
- PORTER, MICHAEL (1987). *From Competitive Advantage to Corporate Strategy*, Harvard Business Review, 65, 43–59.
- PORTER, MICHAEL (1996). "What Is Strategy?," Harvard Business Review, , 61–78.
- PRAHALAD, C.K. and RICHARD BETTIS (1986). "The Dominant Logic: A New Linkage Between Diversity and Performance", *Strategic Management Journal*, 6, 485–501.
- PRAHALAD, C.K. and GARY HAMEL (1990). "The Core Competence of the Corporation", *Harvard Business Review*, 68, 79–91.
- PRAHALAD, C.K. and YVES L. DOZ (1992). "Evaluating Interdependencies Across Businesses", in Campbell, Andrew and Karen S. Luchs, eds. *Strategic Synergy*. London: Butterworth-Heinemann
- RUMELT, RICHARD P. (1974). *Strategy, Structure, and Economic Performance*. Harvard University, Graduate School of Business Administration, Harvard.
- SANCHEZ, RON (1993). "Strategic Flexibility, Firm Organization, and Managerial Work in Dynamic Markets", *Advances in Strategic Management*, 9, 251–291.
- SANCHEZ, RON & HOWARD THOMAS (1996). "Strategic Goals", in Sanchez, Ron, Aimé Heene, and Howard Thomas (1996b).
- SANCHEZ, RON, AIMÉ HEENE, and HOWARD THOMAS (1996a). "Towards the Theory and Practice of Competence-Based Competition", in *idem*. (1996b).
- SANCHEZ, RON, AIMÉ HEENE, and HOWARD THOMAS, editors (1996b). *Dynamics of Competence-Based Competition: Theory and Practice in the New Strategic Management*. Elsevier Pergamon Press, Oxford.
- TEECE, DAVID J. (1982). "Towards an Economic Theory of the Multiproduct Firm", *Journal of Economic Behavior and Organization*, 3, 39–63.

- TEECE, DAVID J.** (1986). "Profiting From Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy", *Research Policy*, 25, 285–305.
- TEECE, DAVID J., RICHARD P. RUMELT, GIOVANNI DOSI, and SIDNEY G. WINTER** (1994). "Understanding Corporate Coherence: Theory and Evidence", *Journal of Economic Behavior and Organization*, 23, 1–30.
- TEECE, DAVID AND GARY PISANO** (1994). "The Dynamic Capabilities of Firms: an Introduction", *Industrial and Corporate Change*, 3, 537–556.
- WERNERFELT, BIRGER** (1984). "A Resource-Based View of the Firm", *Strategic Management Journal*, 5, 171–180.
- WILLIAMSON, OLIVER E.** (1975). *Markets and Hierarchies*. Free Press, New York. Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism*. Free Press, New York.
- YOUNG, DAVID and MICHAEL GOULD** (1993). *Effective Headquarters Staff*. Ashridge Management Centre, London