

Synergies and Sustainable Competitive Advantage

by Mikael Iversen

Department of Industrial Economics and Strategy
Copenhagen Business School
Nansensgade 19, 6
DK-1366 Copenhagen K, Denmark
E-mail: mi.ivs@cbs.dk

Abstract:

Synergy is a concept fraught with ambiguity about its sources and effects, perhaps as a consequence of previous literature on the subject not distinguishing between these. In this paper, the sources of synergy are separated from the sources of sustainable competitive advantage in order to analyze the competitive implications of different types of synergies, and thus be able to answer the question of when and under which circumstances synergy can be expected to generate sustainable competitive advantage.

Keywords:

Synergy, Sustainable Competitive Advantage, Complementarity

Synergies and Sustainable Competitive Advantage

Vertically and horizontally integrated firms exist for a number of reasons. Adam Smith argued that the degree of division of labor is limited by the extent of the market. If demand is insufficient to obtain maximum scale efficiency in certain activities and market imperfections prevent selling excess capacity to external customers, then scale efficient activities provide a rationale for sharing capacity among different lines of business internally (Teece, 1982). The internal workings of firms may also create pressure for growth in the range and size of activities performed. As explained by Edith Penrose (1959), indivisibilities lead to organic growth because increasing the degree of capacity utilization of existing assets through sharing between different uses lead to the acquisition of complementary or supporting resources. These new assets will also be indivisible to some degree, thus leading to continued pressure to expand the size of the corporation to avoid idleness of resources. Dedication of activities to other, complementary, activities also lead to expansion of the firm because dedication creates vulnerability to appropriation of rents by trading partners (Williamson, 1985). For these reasons, firms tend to become diversified in terms of activities and markets served. It is generally believed that the diversity in the assets and activities of diversified firms can be exploited to achieve benefits, often referred to as synergies, by sharing assets and associated activities subject to size economies (economies of scale/scope) or by performing mutually adjusted (complementary) activities.

I. Sources of synergies

Synergies may be obtained by sharing assets between business units if production based on these assets are subject to declining average unit cost, that is if economies of scale or scope can be obtained. One source of size economies is equipment dedicated to a particular task, which allows this task to be performed with greater efficiency than with generic or non-specific equipment (Montgomery and Wernerfelt, 1988). Increased division of labor and specialization of tasks allows subsets of activities to be performed with greater efficiency by reducing the costs of setting up and changing tasks, and by accumulating more experience and knowledge of the particular task. Dedicated equipment and specialized tasks are only efficient when the services they produce are required in high volumes because dedication and specialization comes with a loss of flexibility that reduce the value in alternative use. Thus dedication and specialization create indivisible capacity. Sharing can reduce the loss from idleness of indivisible assets by increasing the degree of capacity utilization. Finally, increasing the dimensions of physical objects (e.g. buildings) may be less costly than multiplying similar, but smaller ones to reach a sufficient scale (Langlois, 1997).

Efficiency gains can also be achieved by adapting different assets or activities to a common purpose by making them mutually supportive and eliminate waste

from reworking of outputs (Porter, 1996). Complementarity can be achieved in a succession of activities where different steps in a chain are adjusted to the preceding and/or proceeding steps for example in the timing of transfer (e.g. JIT), or by improving the interface between activities (making the output fit the input requirements, and/or changing the input requirements to fit the output) (Porter, 1985). Likewise, by adapting to existing resources, new assets can be made more efficient and new opportunities can be exploited faster than if the complementary assets had to be acquired as well. The effects of obtaining complementarity between activities performed in succession will be referred to as vertical complementarities, which can also be obtained at higher (strategic) levels, for example by accompanying product line proliferation, or increased rate of product development, with flexible manufacturing systems and increased customer segmentation (Milgrom and Roberts, 1990).

Complementarities achieved by combining assets or activities to perform a single task can similarly be called horizontal complementarities. Horizontal complementarities may be achieved by adapting parallel activities to each other to increase the value of combining the outputs at a later stage, for example by making intermediate products that fit together when assembled (Whitney, 1988), or by enhancing the combined functionality of bundled products to customers (Spiller and Zelner, 1997).

In other words, synergy can be attributed:

1. *Sharing of indivisible assets whose acquisition cost are amortized over multiple uses.*
2. *Optimization of the fit among sequentially performed activities (Vertical complementarities).*
3. *Combination of the outputs of mutually adjusted activities to achieve superior functionality of the combined output (Horizontal complementarities).*

Important contributors to the field of corporate strategy, such as, Igor Ansoff (1965) and Michael E. Porter (1985, 1987, 1996), argue that synergies confer competitive advantage on diversified firms relative to non-diversified firms. However, competitors may be able to achieve similar advantages by diversifying their activities, in which case synergy only results in competitive parity. The purpose of this paper is to explore under which circumstances the rents created by synergy can be sustained¹.

II. Sources of sustainable competitive advantage

The foundations of competitive advantage for firms has been explored in two

¹ By sustainable is usually meant lasting beyond any competitor's attempt at circumventing the advantage by imitating or substituting the rent generating features of a firm. The concept of sustainability does not, however, say anything about the chronological duration of a competitive advantage although it may be considered infinite in the absence of imitation, substitution and innovation, because even when the advantage is no longer being challenged, it may persist.

broad research streams, one looking for advantages in firm's endowments of resources (e.g. Peteraf, 1993, Barney, 1986, 1991) and the configuration of activities (e.g. Porter, 1996), and another exploring the posture and positioning of firms vis à vis their competitors (e.g. Porter, 1980, 1991, Ghemawat, 1991).

The resource-based perspective (RBP) and the positioning stream may be seen as complementary because they are concerned with different domains (i.e. internal and external factors, respectively), and thus combines to a refined SWOT analysis (Barney, 1991). Studies have found that both industry and firm-level indicators have significant effect on firm performance (e.g. Schmalensee, 1985; Hansen and Wernerfelt, 1989; Rumelt, 1991; McGahan and Porter, 1997; Brush, Bromiley and Hendrickx, 1999) which suggests that the positioning stream and the resource-based stream are complementary. Thus, Mauri and Michaels (1998) found that industry affiliation is the prime determinant of R&D and advertising expenditures, which is interpreted as intra-industry imitation of successful competitors' strategies, whereas performance primarily is determined by firm-specific factors (i.e. the efficiency of implementing strategies). Similarly, Young, Smith and Grimm (1996) found that performance is primarily determined at the firm level while industry effects are of secondary importance. Industry effects was, thus, found to be the prime determinant of the average performance of firms within an industry by Young et al. (ibid.). In other words, industry might be the most important factor in determining performance for the average firm, whereas firm effects determine the performance of high-performance firms. The following sections will describe and contrast the two perspectives on the sources of competitive advantage.

The positioning stream

The positioning stream emerged from the structure-conduct-performance paradigm in industrial economics (Porter, 1981), whose explanatory logic was inverted through Michael E. Porter's seminal book, *Competitive Strategy* (Porter, 1980). Porter's book sought to provide a framework for identifying positions which offered protection from the forces of competition. Protection from competition would allow companies to achieve competitive advantage compared to firms possessing less attractive positions. In contrast, SCP sought to explain why competition was limited, and how it could be increased.

Pankaj Ghemawat's book, *Commitment* (1991) includes Porter's framework, but extends his analysis by applying game theoretic insights to strategy formulation arguing that commitment (i.e. investments and decisions which are costly to reverse) to a selected strategy would deter competition, because competitors would expect profit eroding retaliation from firms threatened by their move.

Thus, the positioning stream argues that sustainable competitive advantage results from the ability to protect a desirable position within an industry by erecting barriers to competition. These barriers would be identified during the analysis of an industry (Porter, 1980) or in the process of evaluating strategic choices (Ghemawat, 1991). While threats of retaliation might deter entry and discipline responses from

existing competitors, market power advantages may only be available to dominant firms, and perhaps only for a limited time since they can be eroded by innovation and changes in market size and preferences (Williamson, 1994). The threat of retaliation may therefore have to be complemented with other barriers to competition, such as specialized assets, switching and search costs, consumer and producer learning, team-embodied skills, unique resources, special information, patents and trademarks, reputation and image, and legal restrictions on entry (Rumelt, 1984). The RBP treats these barriers as resources which the RBP has developed tools for analyzing.

The resource-based perspective

One of the main research agendas within RBP is to understand when a firm's resources become a source of sustainable competitive advantage. The basic assumption of RBP is that the qualities and quantities of resources are unevenly dispersed among competitors. The heterogeneity of the resource bases of different firms means that firms are presented with different opportunities for sharing and adapting their portfolios of assets. The RBP furthermore suggests that assets are accumulated over time (Penrose, 1959, Dierickx and Cool, 1989) and new productive uses are discovered in the process of exploiting and experimenting with the services of the resources (Penrose, 1959). Time thus increases heterogeneity, and the greater the diversity of a firm's asset stock, the greater are the number and variety of potential resource combinations, and consequently opportunities for synergy, available to the firm.

If the supply of resources is inadequate to meet the demands for the services of these resources, inferior resources will be used, thus giving firms that possess the best resources above-normal rates of return because of the comparative advantage of their resources (Peteraf, 1993). Resources may be rare because the supply of them is fixed, such as fertile land or mined substances. Inventors who have enforceable property rights, or the ability to keep important parts of the making of a resource secret, will also be able to restrict the supply of that resource. The composition of a firm's asset stock itself may be firm-specific and, thus, rare. Given the variety of asset stocks possessed by different firms, certain firms may have accumulated more valuable combinations of assets and found valuable uses for these assets that will enable them to capture rents.

A firm cannot capture rents from a scarce resource unless there are limits to the competition for the best (combinations of) resources because otherwise competitors will bid up the price for the resource and let the owner (seller) of the resource appropriate the rent (Peteraf, 1993). Thus, assets, or combinations thereof, yielding competitive advantage cannot be obtained in market transactions, unless the purchaser possesses superior insight regarding the value of the asset or happens to be lucky to acquire them before their true value becomes known (Barney, 1986), except if the acquirer has obtained bargaining power, for example, through other transactions with the seller. The value of a resource may also change after its acquisition, allowing the possessor to obtain competitive advantage. This may happen when the demand for the resource increases after it has been acquired,

because new applications have been discovered by customers.

This may be an important reason for undertaking asset sharing, where assets are (partly) transferred to new and more valuable applications. Asset sharing may lead to the discovery of more valuable applications through internal experimentation and learning of new productive opportunities in which case the asset becomes more valuable than it was at the time of purchase, and this could not have been anticipated at the time of purchase.

Furthermore, there has to be limited possibilities for selling the resources individually, or in valuable combinations (i.e. market failures) at a price equal to their value to the firm, since the firm would then be equally well (or better) off selling the resources, because any cost of exploiting the resources is transferred to the buyer. Differences in the valuation of resources and capabilities may persist after the acquisition, because of asymmetrical information regarding the quality and productive opportunities of the asset. If the cost of communicating the true value of the asset are high (i.e. high measurement costs), it will prevent capture of rents from resale and thus lead to the asset being used internally. Geographical immobility (site specificity) of resources and capabilities, for example due to cost of relocation also presents an impediment to trading resources and capabilities, which makes internal application more profitable. Quasi-rents obtained from combination with non-transferable firm-specific assets may not be recoupable through sale and consequently favor use within the firm (Grant, 1991).

Finally, competitors must be unable to match the firm's offerings by imitating the resources or substituting them with others that yield comparable outcomes, because imitation increases supply while substitution lowers demand which will lower the price that can be obtained for the products (Peteraf, 1993).

These conditions for sustainable competitive advantage are evidently interconnected or overlapping, because, for example, resources that are cheap to imitate cannot be rare (for long). Likewise, the value of a resource is related to the supply of the resource because if anyone can acquire the resource it cannot confer differentiation or cost advantages. A resource which has close substitutes will not be rare in the economic sense since scarcity is defined on the basis of supply relative to demand.

Combined insights from the resource-based perspective and the positioning stream

It may be argued that both RBP and the positioning stream have developed from the same basic insight from industrial organization, that is, that barriers to competition at different levels allow various types of rents to be earned. Thus, in the works of Porter the barriers to competition are described at the level of business units (Porter, 1980, 1987), activities (Porter, 1985), sets of activities (Porter and Rivkin, 1998) and nation states (Porter, 1990, 1991). These different levels of barriers to competition are interconnected and form a chain of causality explaining competitive success (Porter, 1991). The resource-based perspective looks at barriers to competition at the level of resources which could be identified as a level lying in

between the initial conditions (the nation state) and the level of activities. Various types of rents can also be distinguished. Thus rents may stem from innovation granting returns from uniqueness of offerings or processes (i.e. Schumpeterian rents), scarce natural resources in fixed supply may grant Ricardian rents, while superior positions protected from competition may create monopoly rents. Finally the ability to employ resources in higher valued uses may create quasi-rents (Peteraf, 1993).

The main difference between the two perspectives is the source of the barriers, which is either ascribed to factor market imperfections or the existence of market power (product market imperfections). The two streams may be complementary in the insights they offer, to the extent that the positioning stream has added some insights into which resources a firm needs to accumulate in order to stay competitive (e.g. Key Success Factors, or Industry Specific Factors, cf. Amit and Schoemaker, 1993), whereas the resource-based stream has added insights into the conditions surrounding the efficient acquisition and accumulation of resources (e.g. Barney, 1986, Dierickx and Cool, 1989). Besides, only looking at one side of the coin, to borrow a phrase from Wernerfelt (1984), could be misleading because it is impossible to determine the scarcity and substitutability of a resource without examining competitors' asset stocks, just like identification of attractive industries and positions within industries would be futile without assessment of the firm's own productive capabilities, because these determine if its possible for the firm to enter attractive industries. Thus, Chatterjee and Wernerfelt find some evidence that the type of excess resource (physical, intangible or financial) and its relatedness to the industry under consideration are important in predicting diversification strategy and entry mode (Chatterjee and Wernerfelt, 1991; Chatterjee, 1990).

Both the RBP and the positioning stream emphasize substitution as a threat to a firm's competitive advantage². Substitution occurs when customer preferences change, or when innovation produces new valued features or allow production at lower cost (Porter, 1980; Barney, 1986). Thus, substitution may occur both at the positioning level due to changes in preferred product characteristics (price elasticities of features), or at the resource level, when more efficient resources become available. Since substitution is independent of the characteristics of the source of competitive advantage, the likelihood of substitution depends on the rate of innovation and changes in consumer preferences. In other words, synergies are, in general, no more, or no less, likely to be substituted than other potential sources of competitive advantage, because the risk of substitution depends on the relative efficiency of potentially substituting resources and activities. A firm pursuing synergy may,

² The emphasis on substitution rather than (or the neglect of) innovation in both the Barney/Peteraf version of the resource-based perspective and the positioning framework is derived from their common IO heritage which build on a static equilibrium assumption (cf. Jacobson, 1992). Barney (1986) does mention innovation as a source of substitution, though. If continuous, endogenous innovation was allowed within the frameworks, the assumption of equilibrium would be meaningless, since there cannot be an equilibrium, if the competitive situation is constantly changed. The static equilibrium assumption seems almost paradoxical, at least to the resource-based perspective given its simultaneous emphasis on heterogeneity (cf. Jacobson, 1992) and the notable evolutionary influence in the work of Penrose (1959). However, the static equilibrium assumption may be viewed as more restrictive, i.e. that it is more difficult to obtain lasting advantages in markets in states of (near) equilibrium, whereas disequilibrium frameworks view advantages as ordinary, but temporary.

however, be more vulnerable to substitution because substitution of a resource will also affect the activities and resources to which the substituted resource is connected. In other words, it may be difficult for a firm to replace a resource or activity which has been rendered obsolete, because the firm will also have to reconfigure the whole system of resources and activities.

Common to both research traditions is also their emphasis on imitability of the sources of competitive advantage, whether they be productive efficiencies stemming from superior resources, superior organization of transactions, or superior positions. Thus, the important question regarding the sustainability of synergistic advantages would be if competitors are able to imitate the activities involved in creating synergies. From the above discussion, synergies may be protected at one or more of three different levels, that is, at the level of resource deployment analyzed in the RBP; at the level of organizing associated transactions, and at the level of industry position. Protection at either level may be sufficient, but in the, realistic, case of only partial protection at either level, combining barriers to imitation at multiple levels may enhance protection against imitation by raising the cost of imitation³.

III. Imitability of synergies

The combined insights from the positioning and resource-based literatures tells us that imitation may be prevented both by lack of motivation, and by lack of ability. Thus, even if imitation is technically possible, firms may choose not to imitate because imitation will shift the supply curve to a point where rents cannot be earned if capacity is increased in large increments relative to demand (e.g. if MES is high) (Ghemawat, 1991). For commitments to be effective, however, they must be costly to abandon, otherwise the threat of retaliation will not be credible. The commitment will also have to be easily observable, and the implications well understood, or competitors might overlook or misinterpret the competitive implications and go ahead anyway (Porter and Rivkin, 1998). Imitation may also be prevented by legal restrictions in the form of patents and entrenched trademarks and, directly through restrictions on entry in certain sectors (Rumelt, 1984). Likewise, supplier and buyer switching costs may prevent a firm from capitalizing on an imitated asset and therefore remove the incentive to imitate.

The ability of competitors to successfully imitate another firm's asset stocks is greatly reduced in the presence of five isolating mechanisms described by Dierickx and Cool (1989), namely

- *Time compression diseconomies*, which exists when a given level of expenditure over a particular period of time produces a larger increment in the asset stock than the same level of expenditure over a shorter period of time. Crash R&D-programs

³ Off course, certain resources may be strictly inimitable, such as particular locations and certain natural resources which cannot be manufactured artificially, but for most resources inimitability is probably more a question of imitation cost vs. benefits of imitation than of strict inimitability. The same goes for imitation of organizational setups and position, where apparent inimitability results from high costs, for example, because other transactions may be organized less appropriately if another organizational setup is implemented (cf. Argyres and Liebeskind, 1998), or decreased benefits caused by increased competition for the same group of customers (Ghemawat, 1991, 1996).

undertaken to catch up with competitors will, in the absence of an opportunity to copy results directly (reverse engineering), 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 occur 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.
- *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 service-network 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. Causal ambiguity may be caused by tacitness of the knowledge involved in rent generation, in which those who perform the value creating activities themselves do not know, or are unable to explain, the activities they perform and/or their relationship with the results (Reed and DeFillippi, 1990). Complexity caused by a high number of interrelated activities or possible relationships also makes it difficult for an individual to grasp the sources of competitive advantage (Reed and DeFillippi, 1990). Reed and DeFillippi (1990) moreover mention relationship-specific investments as causes of causal ambiguity, but the effect of specific investments is more likely to be of the commitment variety (i.e. deterrence), which probably will work better in the absence of causal ambiguity⁴. The success of the Sony walkman may be attributed a wide variety of causes, such as the insight of Akio Morita, serendipity, 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.

The following sections will discuss how commitments and isolating mechanisms affect the imitability of complementarities and asset sharing.

⁴ Thus, if competitors know the amount of relationship specific investments sunk into a relationship, entry will be deterred because of fear of retaliation. Because unilateral relationship specific investments are unlikely unless accompanied by safeguards (Williamson, 1985), both unilateral and bilateral relationship specific investments are associated with switching costs which have to be overcome by the competitor who wishes to break the relationship before the transaction is completed. The more well-understood (i.e. the less causal ambiguity surrounding the relationship), the less likely will competitors be to try to imitate the activities and resources of the relationship, unless, of course, causal ambiguity leads competitors to systematically overestimate the size of the specific investments. The fact that "*the business actions that result from resource and skill deployment (competencies) can be highly specific and interdependent with the firm's internal and external transaction partners*" (Reed and DeFillippi, 1990: 92, emphasis added) does not explain why the interactions become difficult to observe or understand, although they may become so, depending on their tacitness and complexity.

Imitability of complementarities

Porter (1996) discussed sustainability in relation to sharing and fit (complementarity), and argued that while asset sharing may only lead to short term enhancements of performance because sharing is comparably easy to imitate, achieving fit between complementary activities leads to sustainable competitive advantage, because *“rivals will get little benefit from imitation unless they successfully match the whole system.”* (Porter, 1996: 74).

Complementarities are likely to be protected from imitation by causal ambiguity because the firm is in a better position to obtain knowledge about the interaction among activities than outsiders. Time compression diseconomies, asset mass efficiencies or asset stock interconnectedness are in themselves examples of complementarities. Imitation of complementarities are furthermore protected from imitation by the fact that similar competitive advantage may only be obtained by competitors by imitating all of the assets and activities (Porter, 1996). The barrier to imitation created by complementarity does not stem from the sheer number of activities and assets that must be copied because, without interaction effects, partial imitation may close some of the gap between the imitator and the superior rival. However, uncertainty as to which specific activities that yield advantage (causal ambiguity), and to how these activities can be imitated will lower the probability of successful imitation. If the costs of imitation vary with the number of activities and the probability of successfully imitating each activity is less than 1, then the probability of successfully imitating all of the activities decreases with the number of activities, in which case imitation is deterred by increasing number of activities because the expected benefit decreases while the total cost increases (Porter and Rivkin, 1998).

The limits to managerial capacity, and to its rate of expansion, described by Penrose (1959) can add to the problems of imitating systems of activities, compared to imitation of individual assets or activities in three ways. First of all, limits to managerial capacity limits the number of activities that can be imitated within a period of time. This will limit the probability of successful imitation if the superior firm is capable of further developing its capabilities, which makes speed of imitation important. Speed of imitation may also be important for the imitating firm if the opportunity for exploiting the imitated activities is available for a limited time only, for example in case of changing customer preferences, high levels of innovative activity or early mover advantages. Secondly, limits to managerial capacity may create increasing marginal costs to imitation because managerial capacity has to be diverted from increasingly valuable activities and thus raise the opportunity costs of imitation. Thirdly, limits to managerial capacity may lower the probability of successful imitation because managerial attention is diluted as the number of imitation activities increase (i.e. managers can only spend less time on each project whereby the risk of errors increase).

Imitability of asset sharing

If an asset is inimitable, sharing will lead to sustainable competitive

advantage if the asset have excess capacity, because the asset itself is inaccessible to competitors. Assets that can be used for a wide range of purposes cannot signal commitment to a strategy because they can be redeployed at low cost. Since asset sharing implies flexibility and low cost of redeployment, asset sharing will not deter imitation. Flexible assets will therefore offer little protection from imitation (Ghemawat and del Sol, 1998). However, if the range of applications for a shared asset is narrow, then it may not be redeployable at low cost if the demand for the services of the asset in the alternative applications are too low to ensure full capacity utilization. If coordination costs are assumed to increase with the number of applications, then the fact that an asset is shared implies that the asset cannot be fully utilized if one of the present applications is stopped. Thus, asset sharing may signal commitment to the present pattern of utilization if the competitors cannot observe alternative applications of the asset within the firm. Even when a number of competitors possess similar stocks of assets and target similar market segments they may maintain high returns through mutual forbearance if none of the firms can deploy their shared assets in markets in which the other firms are excluded (Gimeno and Woo, 1999).

The value of a given asset in a particular application depends on both the flexibility of the asset itself, and the requirements posed by the users. A very flexible asset will be able to fulfill very diverse requirements of potential users, but may be less productive (Montgomery and Wernerfelt, 1988)⁵. Greater similarity of the requirements posed by the users will allow shared exploitation of more specific assets (and therefore often less flexible assets according to Montgomery and Wernerfelt (1988)). Assets which are specific to a particular use are more likely to bring competitive advantage because their specialization to a narrow range of purposes both raise their efficiency and signal a commitment to pursuing a strategy that will ensure their utilization, because the investment will otherwise be lost (Ghemawat, 1991). Thus, the value of asset sharing depends on whether the different applications are related in terms of the requirements of the users.

Asset sharing based on generic physical equipment or financial resources may therefore be more easily imitated by competitors, and therefore lead to short term advantages only. Asset sharing of imitable assets may, however, be protected from imitation if competitors cannot adopt a similar range of activities, for example, if they lack the complementary assets (Teece, 1986) to commercialize the outputs from sharing in other areas. If the range of applications, and the consequent adaptations of assets, is firm-specific, sharing will also be hard to imitate unless

⁵ Montgomery and Wernerfelt's argument seem tautological because they define more flexible assets (less specific factors in their terminology) as "*those that lose less efficiency as they are applied farther from their origin.*" (1988: 625). However, if there were no efficiency gains in specializing assets to particular purposes, then there would be no problems of specificity in inter-firm transactions because generic assets would be equally efficient and incur fewer transaction costs. Thus, transaction cost economics assumes that less specific assets at least in some cases are less efficient (result in higher production costs) than specialized assets. This may be especially true for physical assets, whereas flexible intangible assets may be equally valuable in different applications, for example in case of trademarks, reputations and patents. Other intangible assets such as managerial capabilities may on average worth less if they are flexible than if they are dedicated to a special business logic (Prahalad and Bettis, 1986)

competitors adopt a similar range of activities.

IV. Concluding remarks

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. Thus, one way of achieving competitive advantage is through generating and exploiting synergies between the different assets and activities of the firm, because asset sharing and complementarities allow assets to be used more efficiently. When firms pursue different strategies and address different product-markets, they will acquire different asset stocks. This means that there will also be differences in the opportunities for sharing and complementarity presented to, and perceived by, individual firms. Synergies will therefore tend to be firm-specific (rare).

The advantages in efficiency gained from synergy, however, can only be sustainable if imitation of the synergistic activities is deterred by observable commitments or impaired by isolating mechanisms such as 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). Complementarity decreases the probability of successful overall imitation because the benefits of imitating all of a successful competitors assets and activities might be marginal if imitation of just one activity or asset fails. This problem is compounded by limits to managerial capacity which may both prevent ascertaining all the important interaction effects, as well as decrease the probability of imitating the interaction effects themselves correctly because the complexity exceeds their cognitive capacities as the number of activities increase (Porter and Rivkin, 1998). Asset sharing is easier to imitate, but may still be protected if the asset itself is inimitable or applicable to a narrow range of applications only.

Being scarce because of their firm-specific nature, valuable through cost or performance advantages and hard to imitate, synergies may bring competitive advantage to the firms exploiting them. The innovative activity of trying out new combinations or applying assets in new applications also bring with it uncertainty of outcomes. Uncertainty brings mistakes involving new experiments to correct them, which means that sharing and complementarity require frequent changes that adds to industry heterogeneity. Adapting assets to other assets to achieve complementarity, or to other applications for sharing, make the same asset more specific to the combination of activities in which they partake, and therefore of less value in others. Specificity to a particular set of activities also limit the mobility of assets, because other assets have to be moved as well in order to obtain the advantage. This is not to argue that competitive advantage cannot be obtained from individual assets. Thus, it can be proposed that different types of synergy may lead to sustainable competitive advantage if:

- a) The shared asset itself is scarce and difficult to imitate. Asset sharing may furthermore lead to sustainable advantages if the outputs (services) have

limited tradability. Asset sharing may be protected from imitation if similar advantages would have to be obtained by adopting a similar range of activities in order to achieve a similar scale⁶.

- b) Complementarity is achieved among a firm-specific combination of numerous activities and assets. Complementarity is protected from imitation when the advantage does not stem from a single activity or asset, but from the combination of assets and activities which require that competitors imitate all assets and activities.

References

- Amit, R. & P. J.H. Schoemaker (1993). Strategic Assets and Organizational Rent., *Strategic Management Journal*, 14, 33-46
- Ansoff, H. I. (1965). *Corporate Strategy*, McGraw-Hill
- Barney, J. B. (1986). Strategic Factor Markets: Expectations, Luck and Business Strategy., *Management Science* 32, 1231-1241
- Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17, 99-120
- Barney, J. B. (1997). *Gaining and Sustaining Competitive Advantage*. Addison-Wesley, Reading, Mass.
- Brush, T. H., P. Bromiley & M. Hendrickx (1999). The Relative Influence of Industry and Corporation on Business Segment Performance: An Alternative Estimate. *Strategic Management Journal*, 20, 519-547
- Chatterjee, S. (1990). Excess Resources, Utilization Costs, and mode of Entry. *Academy of Management Journal*, 33 (4), 780-800
- Chatterjee, S. & B. Wernerfelt (1991). The link between Resources and type of Diversification: Theory and Evidence. *Strategic Management Journal*, 12, 33-48
- Dierickx, I. & K. Cool (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage, *Management Science*, 35, 1504-1511.
- Ghemawat, P. (1991). *Commitment*. New York, The Free Press
- Gimeno, J. & C. Y. Woo (1999). Multi-market Contact, Economies of Scope, and Firm Performance. *Academy of Management Journal*, 43 (3), 239-259
- Grant, R. M. (1991) The Resource-Based Theory of Competitive Advantage, *California Management Review*, 33 (3), 114-135
- Langlois, R. N. (1997). *Scale, Scope, and the Reuse of Knowledge*. Paper for the conference in honor of Brian J. Loasby August 26-28, 1997, Stirling, Scotland
- Hansen, G. & B. Wernerfelt (1989). Determinants of Firm Performance: The relative importance of economic and organizational factors. *Strategic Management Journal*, 10 (5), 399-411

⁶ If efficient scale could be reached in single purpose application, then there would be no reason for sharing with its implied costs of switching application and coordination.

- Mauri, A. J. & M. P. Michaels (1998). Firm and Industry Effects within Strategic Management: An Empirical Examination. *Strategic Management Journal* 19, 211-219
- McGahan, A. M. & M. E. Porter (1997). How much does Industry matter, really?, *Strategic Management Journal*, 18, Special Summer Issue, 5-14
- Milgrom, P. & J. Roberts (1990). The Economics of Modern Manufacturing: Technology, Strategy, and Organization, *The American Economic Review*, 80 (3), 511-529
- Montgomery, C. A. and B. Wernerfelt (1988). Diversification, Ricardian rents, and Tobin's q, *RAND Journal of Economics*, 19 (4), 623-632
- Penrose, E. T. (1959). *The Theory of the Growth of the Firm*. Oxford University Press, Oxford.
- Peteraf, M. A. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal* 14, 179-191
- Porter, M. E. (1980). *Competitive Strategy*, New York, The Free Press
- Porter, M. E. (1981). The Contributions of Industrial Organization to Strategic Management. *The Academy of Management Review*, 6 (4), 609-621
- Porter, M. E. (1985). *Competitive Advantage*, New York, The Free Press
- Porter, M. E. (1987). From Competitive Advantage to Corporate Strategy, *Harvard Business Review*, 65, 43-59.
- Porter, M. E. (1990). *The Competitive Advantage of Nations*, New York, The Free Press
- Porter, M. E. (1991). Towards a Dynamic Theory of Strategy, *Strategic Management Journal*, 12, 95-117
- Porter, M. E. (1996). What Is Strategy?, *Harvard Business Review*, Nov.-Dec., 61-78.
- Porter, M. E. & J. W. Rivkin (1998). *Activity Systems as Barriers to Imitation*. Working Paper 98-066, Harvard
- Prahalad, C.K. and R. Bettis (1986). The Dominant Logic: A New Linkage Between Diversity and Performance, *Strategic Management Journal*, 6, 485-501.
- Reed, R. & R. J. DeFillippi (1990). Causal Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage, *Academy of Management Review*, 15 (1), 88-102
- Rumelt, Richard P. (1984). "Towards a Strategic Theory of the Firm". In R.B. Lamb (Ed.) *Competitive Strategic Management*. New Jersey
- Rumelt, R. P. (1991). How much does Industry Matter?, *Strategic Management Journal* 12 (3), 167-185
- Schmalensee, R. (1985). Do Markets Differ Much?, *American Economic Review* 75 (3), 341-351
- Spiller, P. T. & B. A. Zelner (1997). Product Complementarities, Capabilities and Governance: A Dynamic Transaction Cost Perspective. *Industrial and Corporate Change*, 6 (3), 561-594
- Teece, D. J. (1982). Towards an Economic Theory of the Multiproduct Firm, *Journal of Economic Behavior and Organization*, 3, 39-63.

Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy, *Research Policy*, 25, 285-305.

Wernerfelt, B. (1984). A Resource-Based View of the Firm., *Strategic Management Journal*, 5, 171-180

Whitney, D. E. (1988). Manufacturing by Design, *Harvard Business Review*; Boston; 66 (4), 83-92

Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism*, New York, The Free Press

Williamson, Oliver E. (1994). "Strategizing, Economizing, and Economic Organization", in Rumelt, Schendel and Teece (eds.) *Fundamental Issues in Strategy*, Harvard Business School Press, 361-402

Young, G., K. G. Smith & C. M. Grimm (1996). "Austrian" and Industrial Organization Perspectives on Firm-level Competitive Activity and Performance. *Organization Science*, 7 (3), 243-254