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CROSS-BUSINESS SYNERGY: SOURCES, PROCESSES AND THE CAPTURE OF CORPORATE VALUE

ABSTRACT

The pursuit of synergy is at the heart of corporate strategy in the multi-business firm. Indeed, the promise of synergy is one of the key rationales for the existence of multi-business firms, as well as a primary reason for strategic moves like acquisitions, diversification and alliances. However, despite the enormous attention that management focuses on different means to achieve cross-business synergies, the realization of cross-business synergies remains an elusive goal for many organizations. Moreover, as the pace of change increases, difficulties in realizing cross-business synergies become even more acute as the sources of synergies within corporations may frequently change. Observations from the literature are that: 1) cross-business synergies exist; 2) the three major sources of synergies are economies of scope, market power, and internal governance advantages; 3) the realization of potential synergies depends on the relatedness of resources, managerial action, and organizational fit; 4) cross-business synergies become more knowledge and process dependent in dynamic markets; 5) the literature is clear on the first two points but vague on the latter two which emphasize the processes by which synergies are actually achieved. Our contributions are: 1) a comprehensive review and integration of a vast literature on cross-business synergies; 2) the identification of three business-unit/corporate level processes that become particularly salient to synergies as market dynamics increase: knowledge transfer, coevolving, and patching.

Keywords: Synergy, dynamic capabilities, organizational processes, corporate strategy

While the literature that is related to cross-business synergies is large and diverse, it has yet to generate a set of reasonably consistent and generalizable findings (Markides & Williamson, 1994; Palich, Cardinal, & Miller, 2000; Ramanujam & Varadarajan, 1989). Consequently, many questions remain with respect to the definition, existence, sources and processes of cross-business synergy. The purpose of this chapter is to provide a comprehensive review and integration of the extent research to help answer these questions. Our intended contributions are: First, we clarify three sources of cross business synergy: economies of scope, market power, and internal governance advantages. Second, we add a fourth source of synergy, recombinative processes. In particular, we describe three business-unit/corporate level processes that become particularly salient to synergies as market dynamics increase: knowledge transfer, recoupling, and patching. The latter two processes, with few exceptions, remain relatively unexplored empirically. Moreover, these processes, which facilitate the transfer and recombination of resources, become especially important in knowledge-based industries and dynamic markets. Finally, we conclude with several avenues for future research.

WHAT ARE CROSS-BUSINESS SYNERGIES?

The term synergy originates from the Greek word *sunergos*, which means to work together. Accordingly, various dictionary definitions define synergy as "the interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual parts…the cooperative interaction among groups, especially among the acquired subsidiaries or merged parts of a corporation, that creates an enhanced combined effect" (Morris, 1992). In the economics and strategy literature, synergy is usually defined as potential cost savings arising from economies of scale or scope that can be exploited (Besanko, Dranove, & Shanley, 2000). Similarly, dissynergy can be defined as occurring when "related diversification strategies result in internal transaction costs outweighing [realized economies of scope]" (Jones & Hill, 1988).

More recently, some researchers have suggested that synergies should be described in terms of outcome measures such as revenue enhancements or value creation, rather than simple cost savings. For example, Davis and Thomas (1993,: 1334) provide a more outcome-based definition that defines synergy as the "super-additivity in valuation of business combinations…[or]…in simpler terms, synergy means that the valuation of a combination of business units exceeds the sum of valuations for stand alone units." Similarly, Goold and Campbell (1998,: 133) define synergy as "the ability of two or more units or companies to generate greater value working together than they could working apart" – a more organizational or process-oriented view.

Our definition, which emerges from the literature, is that cross-business synergies are "the value that is created and captured, over time, by the sum of the businesses together relative to what it would be separately" (Martin & Eisenhardt, 2001,: 3). Like those of Davis and Thomas (1993) and Goold and Campbell (1998), this definition is intended to account for value that is created from cost savings as well as through revenue enhancements. In addition, it encompasses the temporal nature of synergies, where value is created by sharing and recombining resources over time in the building of new competitive advantages. Moreover, this definition implies that synergies should be examined according to external measures (e.g., ROI, ROA), as well as internal measures (e.g., net present value, knowledge transfer), and thus acknowledges the importance of the relationship between the internal and external environment of the corporation in any discussion of synergies.

DO CROSS-BUSINESS SYNERGIES EXIST?

Some scholars have questioned whether or not the corporate level has any real effect on firm performance, suggesting that differences in performance are due primarily to industry and/or business-unit effects (e.g. Rumelt, 1991; Schmalensee, 1985; Wernerfelt & Montgomery, 1988). However, recent studies of the sources of variance in firm performance, utilizing improved sampling and more robust statistical methods (e.g. see Table 1) suggest that corporate effects exist

and are important to firm performance (e.g. for review see Brush, Bromiley, & Hendrickx, 1999). These studies seek to explain firm performance by decomposing the variance of business-unit or firm returns into corporate, business and industry effects (Bowman & Helfat, 2001). The argument of this section is that the existence of corporate effects on variances in firm performance, which capture factors associated with the membership of multiple businesses within the corporation (Bowman & Helfat, 2001), indicates that cross-business synergies (or dissynergies) exist. That is, the corporate level does matter.

Insert Table 1 About Here

One of the first empirical studies to provide evidence supporting the existence of cross-business synergies was conducted by Roquebert, Phillips and Westfall's (1996). These authors found a significant corporate effect of 18% on variance in firm performance. In a similar study across US industries (1981-1994), McGahan and Porter (1997; 1999) found that the relative importance of business-unit, business-segment, corporate and industry effects differed substantially across broad economic sectors. In particular, wholesale, retail, transportation, agriculture and mining showed substantial corporate effects while manufacturing, lodging, entertainment, and services showed almost none. McGahan and Porter (1997) explain these findings by suggesting that the more variegated manufacturing and service sectors offer fewer opportunities for value-creating relationships among business-units. In a later study of the same dataset using more robust statistics, McGahan and Porter (1999) also found that corporate and business-segment effects on variance in performance appear to be relatively stable when examined using a 7-year timeframe. However, when a 14-year timeframe was used, corporate and business-segment effects were observed to erode, suggesting that the sources of cross-business synergies may shift over time (e.g. see also

Davis & Thomas, 1993).

In a set of complementary studies using a Monte Carlo simulation analysis to examine mean effects, Brush and colleagues (1999; 1997) found that the variance effects methodologies used by previous studies (e.g., as in earlier studies by McGahan & Porter, 1997; Roquebert et al., 1996; Rumelt, 1991) were likely to have greatly underestimated the importance of corporate effects due to the non-linear relationships between corporate effects on firm performance and their importance.[1] For example, they found that "variance components appear to be approximately the square of importance" (1997,: 832). Moreover, they also found that in cases where corporate strategies did not affect the *reported* or *actual* profits of the business-units equally (e.g., firms following a BCG or GE matrix, and firms in which only some of the business-units had potential synergies), variance component methods would suggest corporate effects that were significantly below the actual corporate effects. Consequently, even a small observed corporate effect in variance component studies could indicate that important cross-business synergies (or dissynergies) are being realized among the business-units. Brush, Bromily and Hendrix (1999) later tested their arguments with a standard simultaneous equation model on 4114 business segment-year observations (1986-1999). As predicted by the earlier study, the authors observed that corporate effects and business-segment effects mattered as much or more than industry effects in explaining the variance in business-unit performance, particularly in three- and four-segment firms.

Taken together, the corporate effects observed in recent studies provide persuasive support for the existence of cross-business synergies (and dissynergies) in multi-business firms. Moreover, many of the earlier studies that did not find evidence for corporate effects were limited by statistical and/or sampling issues (Bowman & Helfat, 2001). However, studies of the variance in performance are indirect in that, while they suggest that important corporate effects exist, their focus on outcomes (performance) does not provide much specific insight into the nature of corporate effects,

when these effects are likely to occur, the sources of potential synergies, or the processes by which managers realize synergies in multi-business organizations.

WHAT ARE THE SOURCES OF CROSS-BUSINESS SYNERGY?

The question of "what are the sources of synergy?" in multi-business firms' has engendered extensive research over the last 30 years (e.g., for reviews see Amit & Livnat, 1988; Bettis, 1981; Brush et al., 1999; Liebeskind, 2000; Montgomery, 1994; Montgomery & Wernerfelt, 1988; Palich et al., 2000; Rumelt, 1974; Stimpert & Duhaime, 1997b). Most research examines a single source of synergy. However, our review of this literature suggests that there are three major perspectives on the potential sources of cross-business synergy: economies of scope, market power, and internal governance advantages.

The first perspective, economies of scope, focuses specifically on how firms might benefit, in terms of efficiency, from sharing tangible and intangible resources among business-units (for a summary see Table 2). This sharing reduces the per-unit cost of production. The second perspective, market power, argues that diversified firms will "thrive at the expenses of non-diversified firms not because they are any more efficient, but because they have access to what is termed *conglomerate power*" (Hill, 1985,: 828), which allows them to keep prices high relative to costs. Such power is a result of larger size and/or participation in more businesses relative to other firms. The third perspective, internal governance advantages, argues that multi-business firms can outperform their single-business counterparts by creating a more efficient transacting environment than exists in the market. Underlying each of these perspectives are the orthodox economic assumptions of equilibrium, profit maximization, and a well-defined choice set (Nelson & Winter, 1982) that are particularly valid in relatively stable market contexts. In addition, we propose a fourth source of synergy, process, that centers on the assembly and/or recombination of resources, which becomes particularly salient in dynamic markets and knowledge-based industries.

Economies of scope – Sharing of related resources

A foundation for understanding economies of scope was laid out by Penrose (1959) in her analysis of firm growth through continued diversification. Penrose distinguished among three types of diversification that represent a departure from the firm's existing product or service area: "(1) entry into new markets with new products using the same production base; (2) expansion in the same market with new products based in a different area of technology; and (3) entry into new markets with new products based in a different area of technology [or service]" (Penrose, 1959,: 110). Both items 1 and 2 represent types of what we now term "related" diversification. Businesses in a firm are related to each other when they share a common skill, resource or market purpose (Rumelt, 1974), making economies of scope possible. Economies of scope are derived from the sharing of tangible and intangible resources in the production of multiple products and/or services between business-units, resulting in overall lower joint costs of production (Bailey & Friedlander, 1982; Panzar & Willig, 1981).

Insert Table 2 About Here

The opportunity to realize synergies by exploiting potential economies of scope is a primary rationale of related diversification strategies like mergers, acquisitions and organic entry into new product markets. These strategies provide several sources for reducing costs through joint production which include: 1) creating separate products from shared inputs, such as steel and fertilizer being produced from iron ore; 2) having a fixed factor of production (e.g. a manufacturing plant, distribution channel or service organization) that can be more fully utilized than it would producing a single product or service, like using a single service organization that services multiple products (e.g. IBM services, which maintains hardware and software from multiple business-units);

3) networking economies that reduce the costs of producing networked products together rather than separately (e.g. the use of airline hubs to facilitate transfer of passengers from one airline hub to another); 4) reusing of an input in more than one product (e.g. a news article that is read on TV, published in a newspaper and distributed to on-line services); 5) sharing of intangible assets like knowledge between products (e.g. miniaturization capabilities) or brand (e.g. Disney) that is used in creating multiple products. In economic terms, each of these opportunities for creating synergies stems from putting slack (underutilized) resources to productive use (for extended discussion see also Bailey & Friedlander, 1982; Helfat & Eisenhardt, 2001).

Although several potential sources of economies of scope have been identified, the crucial issue is whether multi-business firms actually realize cross-business synergies from these sources. While achieving synergy from economies of scope might seem like a relatively straightforward process, questions still remain: How and when are multi-business firms actually able to share resources and so realize cost savings from economies of scope? Do the resulting economies of scope overcome the internal governance costs required to coordinate and integrate these resources (Jones & Hill, 1988; Nayyar, 1992; Williamson, 1984)? Whether synergy is achieved from economies of scope is addressed by three literatures: 1) diversification-performance; 2) relationships among resources; and 3) organizational context.

Diversification-performance. There is an extensive literature that examines the relationship between diversification and performance (for review see Palich et al., 2000; Ramanujam & Varadarajan, 1989). This literature argues that if diversification is related, then opportunities for economies of scope will emerge. Likewise, if diversification is limited, then there will be few, if any, opportunities for economies of scope. Moreover, if diversification is un-related, then any synergies that result from this type of diversification are due to sources other than economies of scope.

The most widely used proxy for the sources of economies of scope is relatedness, which is the presence of similar activities, or shared tangible and intangible resources at various points on the value chain (Davis & Thomas, 1993; Rumelt, 1974). The argument is that rational managers will exploit relatedness in multi-business organizations in order to reduce the overall per-unit cost of products or services. However, there is no straightforward way to measure actual relatedness among activities and resources. Two approaches have emerged for measuring relatedness: *categorical*, which is judgmental in nature and based on business units' being "in some way" related through "common skills, resources, markets, or purpose" as determined by the researcher (Rumelt, 1974,: 29) and *continuous*, which is mechanistic and typically bases relatedness on the assumption that relatedness can be determined based on indexes that are derived from SIC codes, which represent production similarities (e.g., see Montgomery, 1982; Palepu, 1985). Both of these methods and their derivatives have been used over the last 30 years to explore the linkage between related-diversification and performance.

For example, in his study of post World War II diversified firms, Rumelt (1974) used *categorical* measures of resource relatedness to show that, over time, managers tend to choose either related diversification or unrelated diversification strategies, suggesting both strategies provided different but important benefits. In addition, he argued that related diversification was the superior strategy. Categorical measures are judgmental, and consequently the researcher is able to take into account a broad conception of relatedness. But the labor-intensive nature of this method, as well as its subjectivity and industry/business knowledge requirements, has made it difficult to employ by researchers (e.g. the need for multiple coders, for intimate knowledge of firms being studied, for understanding of how value chain activities are related).

Most diversification studies have used *continuous* measures derived from SIC codes. For example, Bettis (1981) examined the performance differences between 24 related and 25 unrelated

multi-business (diversified) firms using *continuous* SIC-based measures of relatedness. He found that related diversifiers outperformed unrelated diversifiers by only one to three percentage points, suggesting these strategies were equivalent. In a similar cross-industry study of over 250 firms (1977-1983), Amit and Livnat (1988) found little difference in the profitability between single-business and unrelated diversified firms. Nevertheless, they did find that firms that diversified into related businesses had higher profits than their unrelated diversified counterparts, while unrelated diversifiers had better cash flows and financial leverage than related and non-diversified firms. However, measures of relatedness derived from SIC codes only capture the relatedness of the production function, and consequently, miss other important types of relatedness and/or complementarities. This is an important explanation for why, when taken together, these and other similar types of studies are often equivocal, with some supporting the benefits of relatedness and others not (e.g. Berger & Ofek, 1995; Grant & Jammine, 1988; Lang & Stulz, 1994; Palepu, 1985; Ramanujam & Varadarajan, 1989; Simmonds, 1990). That is, there is a lack of consistent and generalizable findings in this literature.

More recently, scholars have tried to untangle the benefits of related diversification from the benefits that single-business (i.e., focused) firms and unrelated diversifiers realize by examining the non-linear relationships between the degree of diversification and performance (e.g. Lubatkin & Chatterjee, 1994; Markides, 1992; Markides & Williamson, 1994; Rumelt, 1974; 1991). These studies argue that limited diversification, a strategy in which a firm focuses on a single-business, constrains the opportunities to put slack resources to use (Lubatkin & Chatterjee, 1994). In contrast, moderately diversified firms, which are assumed to be related diversifiers, are able to generate operational synergies from economies of scope by designing a portfolio of businesses that are mutually reinforcing. However, at some point the coordination costs of sharing and integrating resources are likely to overcome the economies of scope. Rational managers of highly diversified

firms will realize this and consequently seek to derive multi-business synergies from sources other than economies of scope (Markides, 1992). Moreover, this literature assumes that these other potential synergy sources will, in the aggregate, have less value creating potential than economies of scope. Consequently, these studies theorize that the degree of diversification (i.e., number of businesses in which a firm participates) will have an inverted-U shaped relationship with performance.

In their meta-analysis of 82 empirical studies of diversification conducted over the last 30 years, Palich, Cardinal and Miller (2000) specifically examined whether this inverted-U relationship exists. They found persuasive support that moderately diversified firms (related diversifiers) performed better than either single-business firms or highly diversified firms (un-related diversifiers). This relationship was particularly strong for studies that used accounting-based measures (e.g., ROS). Those studies that used market-based measures (e.g., market-to-book value or Tobin's *q*) had similar, but less significant, results. A similar, inverted-U shaped diversification-performance relationship has also been observed in earlier studies of firm portfolio theory (Lubatkin & Chatterjee, 1994) and international diversification (Hitt, Hoskisson, & Kim, 1997). While these studies use methods and samples that are not directly comparable, when taken together, they do show a non-linear pattern of an inverted-U shaped relationship between diversification and performance. Moderately diversified firms perform better than single business/slightly diversified firms and highly diversified firms.

The conclusion that can be drawn from this literature is that related diversifiers outperform unrelated and non-diversified firms, which is consistent with arguments that economies of scope are an important source of potential synergies (for an expanded list of studies, see Barney, 1997,: 388-389). Empirically, there are two main measures of relatedness in the diversification-performance literature: *continuous* measures that are derived from SIC codes that mainly capture the production

function; and *categorical* measures (e.g., Rumelt, 1974) that are based on judgments of relatedness. However, diversification-performance studies are indirect in that, while they suggest that important economies of scope exist, they reveal virtually nothing about how they are achieved. In addition, many of the studies in this literature use continuous measures, like those derived from SIC codes, that have limitations in their ability to capture multiple dimensions of relatedness and, not surprisingly, are somewhat equivocal in their findings of a diversification-performance linkage.

Relationships among resources. More recently, strategy researchers have begun to unpack economies of scope by taking a more complex view of the relationships among resources and the contingencies that affects those relationships. The argument is that, if diversification is related in terms of technologies, products and/or markets, then opportunities for economies of scope will emerge across different points in the value chain and change over time (e.g., Porter, 1985). Consequently, resources and/or linkages among businesses, which once created value, can become dis-synergistic as the product/market contexts in which they were achieved change.

For example, in a study of the linkages between types of resources, relatedness and synergy of 45 firms in the U.S. pharmaceutical industry (1960-1980), Davis and Thomas (1993) created a direct measure of synergy, strategic diversity, to capture value along multiple value-chain dimensions. They found that "all types of relatedness are not synergistic at any point in time" (1993,: 1345) and that relatedness and/or complementarities that once created synergies can become synergy neutral or even negative as the patterns of synergy shift with the industry life cycle. Specifically, they found that relatedness in the production function between drugs and chemicals became dissynergistic after 1962, while relatedness between drugs and agricultural products became synergistic – probably due to relatedness in the innovation rather than production stages of the value-chain. Likewise, they found that a dissynergy between drugs and healthcare prior to 1962 became synergistic in the late 1970's – due primarily to complementarities among the marketing

and other value-chain activities across the businesses. Thus, this study illustrates three important findings: Production relatedness alone does not guarantee synergy over time, dissynergies exist, and the patterns of synergies (and dissynergies) among the value-chain activities shift over time. Their observations also suggest that relatedness among complementary value-chain activities that are more knowledge-based, like marketing and product innovation, appear to be more salient to achieving cross-business synergies in changing market contexts.

Other recent studies have taken a more complex view of relatedness by using methodologies examining relatedness among different types of resources. For example, in a recent study of 158 large diversified manufacturing firms, Farjoun (1998) examined the relationship between knowledge and physical bases of relatedness. He constructed eight categories of skill relatedness that were based on a proportional clustering of occupations among firms in his sample and used two-digit SIC codes to categorize physical relatedness. These categories were then compared with different measures of performance. He found that the existence of both skill and physical bases of relatedness had a strong positive relationship to performance, while the existence of only one of the bases of relatedness had a weaker and negative relationship with performance. These findings suggest that the existence of only one base of relatedness may result in dissynergies, suggesting that the coordination costs of trying to realize value from limited relatedness may equal or exceed any potential economies of scope that exist. This suggests that multiple bases of relatedness may not only complement each other, but may in fact be necessary to realize synergies from potential economies scope.

In their analysis of 61 mergers and acquisitions over a 30 year period, Larsson and Finkelstein (1999) found a strong positive relationship between the existence of similarities and complementarities among different value-chain operations, which they call “combination potential” and synergy realization (measured as actual realized benefits such as lower costs and increased

income). They use the case of the acquisition of Italian appliance maker Zanussi by Electrolux as an example of very high combination potential, in which there were moderate to high similarities in operations and high to very high complementarities in products, markets and opportunities for vertical integration (Ghoshal & Haspeslagh, 1990). Moreover, in a post-hoc inquiry in which they replaced combination potential with its components of similarity and complementarity in their analysis, they found that both components still had positive and significant relationships with synergy realization. Thus, independent of similarities, complementarities among resources are an important source of synergies – a "fact that ... has been missing in previous empirical research on M&As [and] may be one reason for the mixed results of the work acquisition "relatedness"" (Larsson & Finkelstein, 1999,: 15).

The conclusion that can be drawn from this literature is that important economies of scope can exist across multiple value chain dimensions, not just the production function, and so it provides broader support for the value of related-diversification than does the traditional diversification literature, which focuses on relatedness of the production function. While the Bailey and Friedlander (1982) view that economies of scope can be derived from sharing costs across the production function is accurate, studies of the relationships among resources suggest that a more complex view of relatedness is also justified. Revenue enhancements can be an important source of corporate value. Different types of resources may be complementary, and consequently need to occur together in order to achieve value. Likewise, the bases of synergy can shift over time in response to changes in markets and technologies. Finally, multiple sources of relatedness and/or complementarities may be required to gain the critical mass needed for synergy realization. However, there is still little theoretical and empirical research that examines these more complex relationships among resources. Moreover, there is little insight into how potential economies of scope are identified and realized by managers in real organizations.

Organizational context. The recent diversification literature suggests that resource relatedness and complementarities are necessary, but not sufficient, conditions for realizing synergies from economies of scope. The logic is that these economies of scope do not happen automatically because they are embedded within social systems (for related discussion see Granovetter, 1985). Specifically, this literature argues that similar organizational contexts and particular organizational arrangements play essential roles in realizing potential economies of scope.

The importance of similar organizational context is especially significant in studies of mergers and acquisitions. For example, in his study of 173 acquisitions in the US manufacturing and mining industry, Datta (1991) found that similarity in top management styles were positively associated with post-acquisition performance (i.e., impact on the acquirers' ROI, EPS, stock price and sales growth). This finding highlights the importance of going beyond relatedness to issues of organizational context like management style (e.g., attitudes towards risk, decision making approach, preferred control mechanisms and communications patterns) in examining the potential synergistic benefits among businesses (e.g., see also Gupta & Govindarajan, 1986). Similarly, in a recent examination of 61 mergers and acquisitions over the last 30 years, Larsson and Finkelstein (1999) found that similar organizational context (e.g., management styles and HRM practices), in addition to relatedness and complementarities among resources, led to synergy realization. Consequently, some degree of organizational fit appears to be required among business-units in order to realize economies of scope in the corporation.

The strategy-structure literature provides some additional examples of the importance that organizational context can have on the realization of economies of scope. For example, in an earlier study of 184 diversified Fortune 1000 firms, Hill et. al. (1992) observed that internal cooperative arrangements were best for related diversifiers. Specifically, they found that the interactions of

related diversification with greater centralization, integration mechanisms, more reliance on subjective and objective non-financial controls, and group incentives had a positive and significant relationship with performance (as measured by ROA). However, the amount of variance that these interactions explained was relatively weak, suggesting that factors other than a simple fit of strategy and structure exist. Similarly, in a recent study of manufacturing companies (1986-1992), St. John and Harrison (1999,: 141) "found no evidence to suggest that, on average, potential manufacturing-based synergies were being converted into superior cost savings or improved competitive position, both of which should lead to improved profitability." However, in a follow-up comparative case study of 13 firms in the sample, they did find that higher performing firms' actively pursued synergies and employed cooperative administrative mechanisms like joint planning processes, task forces, liaisons, common/linked information systems, and group incentives to facilitate the sharing of related resources. In other words synergies were not automatically achieved, but rather required some organizational intervention.

The appropriate role of the corporate center and the administrative mechanisms employed by the firm are inextricably linked to the resource position of the firm in terms of its starting point, market context, and specific resource advantages (Collis & Montgomery, 1997). For example, in their corporate profiles of Newell, Tyco and Sharp, Collis and Montgomery (1997) argue that there is no one best strategy for resource sharing and that these high performing firms each employed different sets of administrative mechanisms that were consistent with the type of resource relatedness (i.e., physical, knowledge, and/or business process) and the scope of the corporation. For example, Sharp, which had a high degree of relatedness among product divisions, employed a large corporate center and behavioral incentives that rewarded cooperation to coordinate the sharing of physical and knowledge based resources (cf. Hill et al., 1992).

Goold and Campbell (1998) make a dispositional argument that managerial bias can often

lead the corporate center to view potential synergies as more attractive and easily achievable than they actually are. They suggest that the role of the corporate center is to determine the value of potential synergies, and then to selectively "parent" opportunities that the corporate center determines as having high-value, but on which the managers of the businesses are either unable or unwilling to execute. This is a top-down approach that assumes the corporate parent knows best. Consequently, the role of the corporate center can have a substantive effect on whether synergies or dissynergies are ultimately realized (Collis & Montgomery, 1998; Goold & Campbell, 1998).

In conclusion, the recent studies of diversification that examine organizational context suggest that synergies from economies of scope do not happen automatically simply because related and/or complementary resources are present. Rather, these studies suggest that achievement of synergies requires management. Specifically, similar management styles and human resource practices as well as the employment of administrative mechanisms to achieve coordination are salient factors in the ability of organizational managers to capture corporate value through synergies. Likewise, cooperative incentive structures, like group based rewards and individual evaluations based on cooperative behaviors rather than objective measures of business performance, appear to be important to realizing economies of scope. Moreover, some of these studies suggest that a fit between the specific administrative mechanisms and strategy is essential to achieve synergies. Finally, these studies indicate the role of the corporate center is to take a top-down parenting approach of deciding what synergies are most valuable, and then selectively to intervene to ensure that these synergies are effectively pursued.

In summary, the studies on economies of scope reviewed above suggest that: 1) since related diversifiers outperform their single-business and unrelated diversified competitors, synergies that are derived from economies of scope are more valuable than those that are derived from other sources; 2) resource combinations that lead to synergies are more complex than traditional

economies of scope arguments imply, as they can involve both similarities and complementarities along the multiple different value chain dimensions of the corporation; 3) consequently, studies that use measures of relatedness derived from SIC codes are limited as they are examining only one dimension of relatedness (i.e., the production function); 4) resource combinations that yield synergies can change over time as businesses and markets evolve; and 5) executives must manage the achievement of synergies because organizational factors like common management styles, cooperative incentives schemes, cooperative administrative mechanisms, and a top-down corporate management role are important in achieving economies of scope.

Market power – coordinated action among business-units

A second source of cross-business synergies is market power. From its roots in the economics literature (e.g., Caves, 1981), this literature argues that the managers of multi-business firms can employ mechanisms to create and exploit market power advantages that are largely unavailable to their more specialized single-business competitors. This, in turn, creates anti-competitive effects that favor the multiple business firm (for a summary, see Table 3).

Several mechanisms for exercising market power have been suggested: 1) predatory pricing, wherein a firm's managers use its profits or capabilities in one or more markets to support below market and/or cost pricing in another market; 2) reciprocal buying and selling, wherein firms establish favorable reciprocal arrangements with firms that are simultaneously suppliers and customers; 3) multi-point competition, whereby multi-business firms can engage in mutual forbearance strategies (creating collusive behavior) with other multi-business firms with which they have contact in multiple product markets. These mechanisms create synergy by facilitating anti-competitive behavior that keeps prices high (relative to costs) and thus creates more total value (i.e., synergy) for the multi-business firm than would be possible by simply summing the potential value of the individual businesses.

Predatory pricing. Predatory pricing is generally defined as sustained price-cutting with the express intent of driving existing competitors from the market or deterring future competitors from entering the market (Barney, 1997; Besanko et al., 2000). This definition goes beyond the more strict definition of 'pricing below marginal cost', and encompasses limit and penetration pricing (e.g., Besanko et al., 2000) as they have the same fundamental logic, particularly in cases with information economies. The logic behind predatory pricing is that short-term losses will be offset with gains from future higher prices and/or market share (Saloner, 1987). The mechanism that makes this possible is cross-subsidization with excess revenues from other business in the corporate portfolio (Berger & Ofek, 1995), with the objective being to drive competitors out of the market and to discourage new entrants (i.e., as in the strict case of limit pricing).

In the classic case of predation, a multi-business firm with 'deep pockets' uses its superior financial strength to wear down and consequently drive a competitor with 'shallow pockets' out of the market. Likewise, a multi-business firm can deter entry from potential rivals by creating a reputation in the market for willingness to engage in predatory pricing behavior (Saloner, 1987). For example, Microsoft used predatory pricing to effectively cripple Netscape as a competitor in the web browser market by giving Windows Explorer away for free while cross-subsidizing its continued development and ultimate integration into its Windows operating system platforms.

Insert Table 3 About Here

Similarly, the bundling of related products can also be a form of predatory pricing in that it lowers the overall average cost of each individual product and thereby keeps market prices for similar products artificially low. This has the effect of deterring competitors from remaining in or entering the market, while at the same time increasing the overall market share of the focal multi-

business firm. For example, Microsoft's Office Suite exploits the technological similarities of Word, Excel, PowerPoint and Access (i.e., they all run under Windows and have the same "look and feel") by bundling them together and offering them at a substantially lower price than the products are sold for individually. This bundling of related products has greatly increased Microsoft's overall market share and consequently its value (i.e., realized cross-business synergy). In addition, it has forced consolidation among its existing competitors in these product categories and deterred entry of new competitors into the word processing, spreadsheet, presentation and database product areas. In short, predatory pricing can increase overall revenues or prices relative to cost in the long run, and thus create synergy.

Reciprocal buying and selling. Reciprocal buying and selling occurs when a multi-business firm leverages the market share of one or more of its businesses by entering into buying and selling arrangements with firms that are simultaneously suppliers and customers to the corporation. This means giving purchasing and/or contracting preferences to suppliers that are willing to become good customers (i.e., they sole source and/or do not try to drive down prices), a strategy that by definition is not available to single-business competitors. Consequently, greater diversification into complementary markets yields increased opportunities to realize value from strategies like reciprocal buying and selling (Palich et al., 2000).

The logic is that these types of reciprocal relationships will have the effect of maintaining market share, and consequently revenues and profits for those firms in the reciprocal arrangements. For example, a multi-business firm could try to create value through acquiring a related business, and then arranging for its existing customers, who are not already customers of the related business, to shift their purchases to the new division (Grant, 1998). For example, General Dynamics acquired Liquid Carbonic Corporation in 1957 under the belief that it could influence their existing suppliers to shift purchases from its competitors to the new Liquid Carbonic business-unit (Grant, 1998,:

377).

Still, despite the conceptual appeal that market power strategies of predatory pricing and reciprocal buying have, there is little other than intuition and anecdotal evidence to suggest that cross-business synergies are actually realized from these types of anti-competitive strategies (Bolton & Scharfstein, 1990; Grant, 1998; Saloner, 1987).

Multi-point competition. Situations of multi-point competition, in which firms compete with each other simultaneously in several geographic and/or product markets, are pervasive. For example, HP and IBM both competed for years in the markets for laser printers, personal computers and mini-computers. Similarly, Ford and General Motors compete in the automotive and electronic defense markets. Consequently, under certain conditions, these firms have opportunities to realize synergies by engaging in strategies of *mutual forbearance* with similarly diversified competitors and thereby keep prices high across the products/markets that they have in common (Karnani & Wernerfelt, 1985).

In a formal econometric model analysis of multi-point competition, Bernheim and Whinston (1990) explored the effects of multi-point contact on the degree of cooperation that firms could sustain in setting of repeated competition. They found that, under conditions of differences in markets, firms, or technological returns to scale, opportunities would exist for firms to exploit different types of cooperative behaviors that would increase overall economic benefits for competing firms. "...When firms differ in their costs of production across markets or when scale economies are present, multi-market contact allows the development of 'spheres of influence', which enable firms to sustain higher levels of profits and prices" (1990,: 2). For example, if firm A has a small presence in a major market of a competitor firm B, then it has the ability to threaten firm B's profitability at small risk to itself, by reducing its prices in that market. However, if firm B has a similar small presence in a major market of firm A, each firm has the capability to counter attack

the other in the face of price competition. The logic is that since both firms have similar abilities to damage the others profitability in specific markets at similarly small risk to their overall profit, then the most efficient strategy for both is to signal this ability and ultimately pursue a strategy of mutual forbearance.

Evans and Kessides (1994) validated Bernheim and Winston's (1990) econometric model in an empirical study of the U.S. airline industry (1984-1988). They found that airline fares are higher in city-pair markets that are served by carriers with extensive inter-route contacts, suggesting that airlines refrained "from initiating aggressive pricing actions in a given route for fear of what their competitors might do in other jointly contested routes" (1994,: 341). Similarly, in an empirical study of U.K. manufacturers, Hughes and Oughton (1993) found that increases in multi-market contact had a positive effect on industry profitability, supporting the cooperative behavior arguments in Bernheim and Whinston's (1990) model. In addition to providing empirical support that multi-point contact can create opportunities for synergies, these studies also suggest that some related resource differences among multi-business firms are important, as without resource differences it would be difficult to achieve a *mutual foothold equilibrium* condition and achieve unique spheres of influence. Consequently, resources and the ability to coordinate their deployment are important elements in a firm's ability to engage in strategies of mutual forbearance.

Three observations can be made from the literature on multi-point competition. First, multi-point competition creates synergies when other multi-point players exist and all cooperate to keep prices high by engaging in strategies of mutual forbearance. Second, the ability to deploy related resources among business units is a necessary factor in executing strategies of mutual forbearance, which suggests that strategic and organizational processes may be important to creating value in circumstances of multi-point competition. Finally, these studies are only suggestive because they examine the outcomes of multi-market contact, rather than the actual coordinated processes that are

necessary to effectively execute strategies in multi-point competition.

In conclusion, the market power perspective is based on reasonably well-developed economic theory that suggests how firms might obtain synergies from anti-competitive behaviors that are not available to their single-business competitors. However, this perspective has narrowly focused on a few types of behaviors (i.e., predatory pricing, reciprocal pricing, and mutual forbearance), rather than on alternative ways in which multiple business firms might engage in coordinated action in the market. For example, corporations might leverage the pervasiveness of one product by insisting that preference be given to products from other business-units (e.g., Microsoft's requiring PC vendors that bundle MS Windows to also prominently display other MS products on the welcome screen). Further, they provide little insight into the organizational arrangements and contexts in which managers actually work in concert to create synergy from market power sources.

Internal governance advantages—monitoring, incentives and the distribution of capital

Internal governance advantages refer to the ability of managers of multi-business firms to reduce the costs of intrafirm exchanges, relative to the costs of conducting similar exchanges in the market, that are not available to their single-business competitors. For example, transaction cost economics views firms as an efficient way to govern economic activities that involve difficult to trade assets or resources, particularly when issues of bounded rationality, small numbers bargaining, opportunism, and asset specificity are considered (Coase, 1937/1991; Rindfleisch & Heide, 1997; Williamson, 1975; 1996a; 1996b). Likewise, principle-agent theorists see firms as an efficient way to monitor agents and align incentives in situations of non-separability of outputs. In these situations, rational and maximizing individuals (i.e., agents) will find it in their self-interest to achieve the goals of the firm, or more specifically, those of the owners of capital (Alchian & Demsetz, 1972; Berle & Means, 1932; Burawoy, 1979; Fama & Jensen, 1983). Thus, while

economies of scope create cost savings by sharing related resources and market power maintains high prices by anti-competitive behavior, internal governance advantages provide potential cost savings by improving the efficiency of internal transactions among business-units in ways not available to single-business firms (Williamson, 1975). This is accomplished by: 1) a multi-business organizational form, which brings exchange transactions under the control of the firm; 2) organizational arrangements, which link structure, incentives and control systems to strategy; and 3) internal capital markets, which provide greater efficiency in obtaining and allocating financial resources.

Multi-business organizational form. The principal mechanism that is employed to achieve internal governance advantages is the multi-divisional organizational form (M-form) and its variants (Williamson, 1975). This, in turn, can be thought of as creating an internal network of capital, product and knowledge transactions that can be conducted more efficiently than in the market (Gupta & Govindarajan, 1991). The underlying argument for the multi-divisional organizational form rests on a transaction cost economics point of view, where the corporation is seen as providing a superior (i.e., more efficient) means to transfer information, allocate resources, manage boundaries, employ incentives and monitor performance than available to single-business firms in the market (Chandler, 1977; Chatterjee, 1986; Coase, 1937/1991; Jones & Hill, 1988; Klein, 1988; Porter, 1979; Williamson, 1975; 1996a; 1996b). Thus, the reduction in the costs of capital, monitoring and control, and the improvements in information and resource sharing among the businesses in the M-form relative to those of a single-business competitor create the synergies.

For example, in his study of the Fisher-Body General Motors relationship, Klein (1988), observed that increasing market transaction costs due to asset specificity and the resulting "holdup potential" led to the acquisition by General Motors of Fisher-Body. In effect, this integration of Fisher-Body by General Motors was pursued to create important linkages between the design and

manufacturing of automotive chaises and body components businesses. Moreover, by bringing the businesses of Fisher-Body under their control, General Motors was able to employ incentives and monitor performance in ways that would not have been possible in a market relationship (Freeland, 2001). Furthermore, greater efficiencies were realized as the governance processes that made these linkages valuable were incorporated into the overall internal governance structure of GM (Helper, MacDuffie, & Sabel, 1999).

In summary, the M-form provides a mechanism by which a more efficient transacting environment is created among a network of businesses (i.e., business-units) than would be available to a similar network of single-business firms transacting in the market. This efficiency is brought about by corporate control through governance mechanisms that are instituted to regulate transactions among the corporate office and the business-units (Williamson, 1975; 1999). Thus, the lower cost of transacting provides synergy. However, transaction-cost logic does not directly address the specific nature of governance mechanisms (i.e., organizational arrangements) or how they might vary in different strategic or market contexts.

Organizational arrangements. The multidivisional organizational structure (M-form) alone will not result in synergies because the managers must also adopt appropriate organizational arrangements that have a fit among strategy, structure and control mechanisms (Coase, 1937/1991; Gupta & Govindarajan, 1986; Hill & Hoskisson, 1987). Agency theory, which focuses on the importance of incentives, risks, and self-interest in coordinating action (Perrow, 1986), provides a means to extend the transaction-cost arguments of the M-form by examining the linkages among transactions within the firm (Barney & Hesterly, 1996).

Incentives represent the primary control mechanism in such organizational arrangements in the literature. The argument is that, when the interests of the business-units and the corporation are aligned, business-unit managers will be motivated to pursue those synergies with their sister

business-units that have value-creating potential for the corporation. However, if interests are not aligned, dissynergies may be created because business-unit managers may pursue goals that are not consistent with the overall corporate strategy, unless they are actively monitored. Thus, the ability to better align incentives among the business-unit managers with the goals of the corporation and/or more efficiently monitor behavior enables the creation of corporate value beyond what a single business firm can accomplish through market arrangements.

While the importance of incentive alignment seems clear, there is a paucity of empirical research that examines the agency relationships among the business-unit managers and the corporation. One important exception is a study by Hoskisson, Hitt and Hill (1993) of 184 major US firms in which they examined the relationship between business-unit manager incentives and long-term investments in R&D. They observed that incentives based on short-term business-unit financial performance are negatively related to total firm R&D intensity. They suggest that short-term financial incentives affected the risk orientation of business-unit managers, making them more risk averse to long-term investments like R&D. Thus, managerial incentive alignment is an important factor in aligning behavior with corporate goals like future value creation (e.g., investments in R&D). In contrast, similar examinations of executive behavior at the CEO and board of director level have found little linkage between executive incentive/compensation plans and the goals of shareholders (e.g. see Eisenhardt, 1989; Harrison, Torres, & Kukalis, 1988; Rindfleisch & Heide, 1997; Shelanski & Klein, 1995; Westphal & Zajac, 1994; Westphal & Zajac, 1998). Consequently, the linkages between managerial (i.e., business-unit and corporate) incentives and corporate goals remain modest.

The M-form firm also provides advantages that are derived from the flexibility that managers have in aligning the structure and strategy relationships in the firm that are not available in the market. For example, the literature suggests that related and unrelated diversified (i.e., M-

form) firms require organizational arrangements that differ in important ways (Chandler, 1962; Hill & Hoskisson, 1987; Mintzberg, 1983; Rumelt, 1974). Porter (1985) argues that related diversified firms must have cooperative organizational arrangements in order to coordinate the activities of otherwise independent business units. These cooperative arrangements are implemented through centralization, tight coupling of divisions, increased information, and weak (subjective and group) incentives to deal with the complexity and uncertainty of managing the related M-Form (Govindarajan & Fisher, 1990; Mintzberg, 1983; Ouchi, 1980). Likewise, other scholars have argued that unrelated diversified firms are best served by competitive organizational arrangements that are characterized by decentralization, autonomy, and strong incentives (i.e., incentives that are objective and business-unit focused) (Jones & Hill, 1988; Williamson, 1975). For example, in a study of 184 Fortune 1000 firms, Hill, Hitt and Hoskisson (1992) found that related diversified firms performed better when they had cooperative organizational arrangements while unrelated diversified firms performed better with competitive organizational arrangements. This suggests that fit between strategy and structure drives superior performance.

However, choices between organizational arrangements and strategy are not as distinct as the theory might suggest (Zenger & Hesterly, 1997). For example, in their study of 58 SBU's in eight firms that explored the relationship between administrative mechanisms and market contexts, Gupta and Govindarajan (1986) found that resource sharing was the most effective strategy for SBU's pursuing a low-cost rather than a differentiation strategy, subjective rather than formulaic approaches for determining SBU general manager bonuses were most effective when resource sharing was high, and high resource sharing among SBU's had a negative effect on general manager job satisfaction. In addition, they found weak support for the value of linking general manager bonuses to group performance of related SBU's. Likewise, in a follow-up study, Gupta (1987) found that openness in corporate and SBU relationships, and subjective performance measures were

positively related to strategies of differentiation and negatively related to strategies of low-cost or short-term earnings. In contrast, he observed that autonomy of the SBU was positively associated with performance regardless of the strategy employed. These findings suggest that systematic variations exist in the utility of resource sharing, types of strategies, and administrative mechanisms employed by multi-business firms. These findings offer a more complex view of corporate governance than the simpler related-diversification/cooperation and unrelated-diversification/competition distinctions.

In summary, multi-business firms have much greater flexibility in creating efficient organizational arrangements among their businesses than do their single-business competitors, who must rely on market-based contracting relationships with other firms. This efficiency is a result of the flexibility in incentives and improved monitoring that exist in the multi-business firm. While strategy appears to affect the appropriateness of specific organizational arrangements, the empirical literature also suggests that maintaining some degree of autonomy among the businesses is beneficial regardless of the strategy employed. Thus, while this literature is reasonably well-developed theoretically, only very modest and sometimes conflicting empirical evidence exists for the efficacy of various theorized agency relationships within the multi-business corporation.

Internal capital markets. Internal capital markets create potential cross-business synergies by providing diversified firms with lower capital costs than are available to their single-business counterparts. The lower costs of capital are, in part, a result of the risk diversification, co-insurance characteristics, and the reduced information asymmetries of diversified firms. These are argued to provide greater access to debt as well as a lower market cost-of-capital for business-units. Therefore, they provide both financing and tax benefits that reduce the cost of capital to business-units in the corporation relative to the cost of capital is likely to be for single-business firms (Besanko et al., 2000; Liebeskind, 2000).

These lower capital costs are also, in part, a result of enhanced flexibility. That is, these firms enjoy the flexibility of being able to access both the external market and internally generated resources (Lang & Stulz, 1994; Stulz, 1990) such that overall capital costs can be lowered. In addition, this flexibility enables managers to shift capital among businesses within the corporate portfolio. This is the underlying logic, for example, of the BCG growth/share matrix whereby a parent firm is able to use profits from one business (i.e., "cash cows") to subsidize another more promising but as yet unrealized business (i.e., a "rising star" or "problem child") that would be costly to finance in the market (for discussion see Besanko et al., 2000,: 94-95). Yet, despite the appeal of this argument, the empirical observations of the benefits of internal capital markets are equivocal (e.g. see studies by Chatterjee, Lubatkin, Schweiger, & Weber, 1992; Kaplan & Weisbach, 1992; Lang & Stulz, 1994; Servaes, 1996).

One explanation for the lack of consistent support for the realization of synergies from internal capital markets is that there might be more and less effective ways to manage these internal markets. For example, Fluck and Lynch (1999) examined this issue by exploring the seemingly contradictory empirical findings that mergers increase the combined value of the acquirer and the target, and yet that diversified firms are generally less valuable than more focused firms (e.g. see studies by Berger & Ofek, 1995; Lang & Stulz, 1994; Servaes, 1996). They developed a financial model whereby mergers and divestitures could be viewed as a technology that allows the financing of marginally profitable net present value projects, which investors would otherwise reject. Once profitability improves, the internal capital market synergy ends. The acquirer can then obtain that synergy by divesting the business and thereby realize gains from the market while at the same time avoiding internal coordination costs that are no longer efficient. Still, internal capital market approaches like the BCG matrix focus exclusively on how business-units add value to the corporation. But, they leave unanswered the question of how corporations can, if at all, add value to

the businesses themselves (Goold, Alexander, & Campbell, 1994).

In conclusion, studies of internal governance efficiencies suggest that multi-business firms, relative to single-business competitors: 1) realize transaction-cost efficiencies that result from flexibility in placing exchange relationships inside or outside of the firm, thereby creating more efficient firm boundaries; 2) have lower agency costs due to better monitoring, more tailored incentives, and improved strategy-structure fit than available through market mechanisms; and 3) have lower costs of capital that are gained by being able to flexibly access both internal and external capital markets, and by rapidly shifting capital among businesses for more productive usage.

Processes of cross-business synergies—recombination of resources

A fourth source of synergy, that we propose, is the strategic processes by which the resources of multi-business firms are recombined to capture corporate value. While the previously discussed sources of potential synergy (i.e., economies of scope, market power, and internal governance advantages) remain germane, the process perspective, which emphasizes the value of effective routines, or more accurately, dynamic capabilities, moves to the foreground in the capture of corporate value (Eisenhardt & Martin, 2000). Accordingly, this section takes a dynamic perspective that views synergy as resulting from processes of resource recombination over time (Anderson, 1999; Burgelman, 1991; Eisenhardt & Galunic, 2000; Lewin & Volberda, 1999; Martin & Carlile, 2000; Van den Bosch, Volberda, & Boer, 1999).

Process-based synergy is especially relevant in dynamic markets where processes become critical as the bases of synergy shift and the creation of corporate value becomes dependent on dynamic capabilities that reconfigure resources over time (Eisenhardt & Martin, 2000). That is, in such markets, the ability to reconfigure resources becomes central to achieving corporate value – not simply possessing resources or having opportunities to engage in market power. For example, diversification decisions like acquisitions, market entry, business reconfiguration, and divestiture

usually take place in a series of continuous ongoing moves. These moves often build on each other and thus require reconfiguration of resources, as moves occur, in order to create synergies over time (Helfat & Raubitschek, 2000). Similarly, economies of scope may exist around a shared resource (e.g., engineering talent) at one point in time, but may then diminish as the technological trajectories of the cooperating businesses diverge. Therefore, processes become crucial in realigning these resources to match current conditions. Consequently, the business-unit/corporate level processes by which resources are reconfigured become critical in dynamic markets as the basis of synergy may constantly shift (Eisenhardt & Martin, 2000).

Second, process-based synergy is also likely to be especially important for knowledge-based businesses because knowledge is a particularly fungible resource. Consequently, processes that facilitate the transfer and recombination of knowledge resources can be an especially important source of synergy from scope economies. The logic behind knowledge-based scope economies is that, when the costs and time required to transfer and integrate knowledge among business-units are less than the time and cost it would take for competitors to develop or acquire similar knowledge, then economies of scope can be realized. For example, in their study of research and development in pharmaceutical companies, Henderson and Cockburn (1994) found that larger multi-business research efforts are more productive, not only because they enjoy economies of scale, but also because they realize economies of scope by sustaining diverse portfolios of research projects that capture internal and external knowledge spillovers. This spreads the costs over a wider range of products as knowledge is transferred among the businesses.

Scholars have also increasingly recognized that knowledge-based resources (i.e., skills, information, routines) are a particularly important source of synergies in changing markets (Eisenhardt & Santos, 2000; Grant, 1991; 1996; Helfat & Eisenhardt, 2001; Winter, 1987). For example, in a recent study of the film industry, Miller and Shamsie (1996) explored the relationship

of types of resources to market context by examining the implications of property-based and knowledge-based resources in stable and dynamic environments. They found that in relatively stable market periods, property-based resources were most relevant to obtaining value and sustaining advantage. Likewise, in volatile market periods, sharing knowledge-based resources, which could be readily reconfigured, appeared to be most relevant to creating value. This suggests that as the rate of market change increase, stocks of knowledge-based resources become more salient to performance than property-based resources (i.e. production oriented resources). Knowledge is also a more fungible resource than physical assets because it can be more readily transferred and applied in very different situations (Martin & Eisenhardt, 2001). For example, capability in lean production can be applied across a wide variety product and service categories (Womack & Jones, 1996).

While process-based synergies can create cost-savings by realigning resources in more cost efficient ways, revenue, growth and adaptation are also important. For example, in a case analysis of a multi-national electronics firm, Helfat and Eisenhardt (2001) observed that processes of corporate reconfiguration led to economies of growth. These processes resulted in the resources of the firm being put to more productive use (cf. Penrose, 1959). Similarly, in their study of the premier product design firm IDEO, Hargadon and Sutton (1997) describe processes by which managers transferred and reconfigured knowledge from previous design projects, to speed and enhance the design process on current projects.

Several recombinative processes for achieving synergies have been suggested: 1) knowledge transfer, which is the process by which knowledge flows through the corporation and is recombined into new value-creating synergies; 2) recoupling, which is the process of identifying, creating and exiting collaborative linkages among the business-units; and 3) patching, the process of recombining business-units to create new matches to changing market opportunities (i.e., adding,

combining, splitting and exiting businesses). This process helps put resources in the corporation to more productive use, thus creating value through inter-temporal economies of scope (e.g., Helfat & Eisenhardt, 2001). Figure 1 provides an illustrative comparison how these processes affect the organizational structure over time.

Knowledge transfer. Knowledge transfer is the process by which knowledge resources are moved around the corporation. Knowledge resources may be explicit (i.e., codifiable), tacit (i.e., linked to individuals), or a socially constructed state of knowing that is grounded in work practices (Cook & Brown, 1999; Nonaka, 1994; Polanyi, 1962; Weick & Roberts, 1993). Corporate value is achieved by reusing knowledge resources in different businesses to yield inter-temporal economies of scope. Knowledge transfer yields synergies not available to single business competitors for several reasons. First, knowledge may be proprietary, and therefore firms may be unwilling to share knowledge or may insist on appropriating much of its value through market mechanisms like licensing. Second, single-business competitors are likely to have less absorptive capacity, a higher degree of causal ambiguity, and more arduous relationships with other businesses than related business-units within the same corporation (Szulanski, 1996). Finally, single-business competitors are more likely to have different organizational contexts in areas like incentives, culture and management practices. Therefore, single-business firms are likely to experience greater difficulty establishing and adapting agreements for sharing knowledge with other businesses than is likely to be the case for business-units that share a similar corporate context (e.g., Gupta & Govindarajan, 1991; 2000).

The ability for business-units to transfer knowledge among themselves is dependent on the "characteristics of the knowledge, the sender, the recipient, and their mutual relationship" (Eisenhardt & Santos, 2000,: 149). Just as *relatedness* among resources is essential to deriving economies of scope, so are *relatedness* (absorptive capacity) and *combinative capabilities* (or

processes) essential to realizing synergies from knowledge-transfer (Cohen & Levinthal, 1990; Kogut & Zander, 1992; Lane & Lubatkin, 1998). For example, in their study of 75 multi-national firms, Gupta and Govindarajan (2000) found that inflows of tacit knowledge (i.e., know-how) were positively associated with subsidiaries' absorptive capacity.

Similarly, in a study of the "stickiness" of the transfer of complex best-practices in eight firms, Szulanski (1996) found that the major barriers to cross-business synergies from knowledge transfer were a lack of absorptive capacity, causal ambiguity, and weak ties between the source and recipient of the knowledge transfer. Moreover, he also found that motivational factors were a barrier to knowledge transfer. Likewise, in his study of 120 new-product development products in 41 divisions of an electronics company, Hansen (1999) found that weak inter-unit ties facilitated search for and transfer of simple (i.e., codified) organizational knowledge. However, he also found that weak inter-unit ties impeded the transfer of complex (i.e., tacit) knowledge to a greater extent than did strong ties. Likewise, in their study of knowledge transfer in MNC's, Gupta and Govindarajan (2000) found that a greater use of formal administrative mechanisms (e.g., liaison personnel, task forces, permanent teams) was positively associated with the ability of MNC's to transfer tacit knowledge among the subsidiaries and the corporate office. These three studies suggest a more 'structural' rather than dispositional explanation for knowledge transfer, a point that has received little attention from researchers (Szulanski, 1996).

Moreover, the relationships that exist between businesses within the same corporation may create knowledge transfer benefits that are difficult for single-business competitors to emulate. For example, in their study of manufacturing innovations in 20 Swedish firms, Zander and Kogut (1995) found that, under the threat of market preemption, greater codifiability and teachability of knowledge were associated with faster knowledge transfer within firms, but not with imitation by other firms. This observation suggests that knowledge is organizationally embedded, making it

particularly difficult for single-business competitors to imitate knowledge-based corporate strategies through market relationships (e.g., see also Mahoney & Pandian, 1992; Markides & Williamson, 1996; Peteraf, 1993).

The knowledge transfer literature provides a good understanding of the characteristics of knowledge transfer processes. Even so, it assumes that the linkages between businesses, once they are established, are fairly stable and are primarily differentiated by the quality and/or type of the linkage (e.g., strong or weak ties). Furthermore, the knowledge transfer literature does not explore the antecedents of linkage formation in any real depth and, in particular, pays little attention to questions of how, when or why linkages might be eventually eliminated. Thus, the knowledge transfer literature, theoretically and empirically, straddles the static to high velocity divide (Eisenhardt & Santos, 2000). Knowledge may be changing, but collaborations and structure are not. Finally, the knowledge transfer literature has an implicit focus on tacit and explicit knowledge resources, and only indirectly addresses the transfer of socially constructed knowledge (i.e., as a form of tacit knowledge). For example, insights being gained from studies of transactive memory in social psychology (e.g., Moreland, Argote, & Krishnan, 1996), that explore how individuals in groups not only learn more about shared group tasks, but also gain understanding about relevant knowledge that other group members possess, have not yet reached the strategy literature.

Recoupling. Recoupling is the process of changing the collaborative links among the business-units in order to exploit the shifting sources of synergy that emerge with changing market opportunities (termed "coevolving" by Eisenhardt & Galunic, 2000). It focuses on combining individual business-unit autonomy with coordination to achieve synergies through economies of scope, market power and/or internal governance advantages. Therefore, it involves frequently creating new linkages between businesses (i.e., sharing resources and coordinating moves) to exploit new opportunities, and dropping linkages that are deteriorating as markets change. Thus,

the links between businesses may often shift in content and number along the business-units' value-chains and across the business-units.

Recoupling creates cross-business synergies in three important ways: First, recoupling realigns collaborative links to focus on opportunities for economies of scope that have the most value-creating potential for individual business units. Second, recoupling creates internal governance advantages by selectively limiting the internal exchange transaction to only those transactions that are currently creating value. Third, recoupling can also facilitate market power by selectively encouraging the coordinated action of business-units to engage in those moves that have the greatest probability of revenue enhancements (i.e., keeping prices high) for the individual business-units.

For example, Michael Eisner, CEO of Disney, attributes the success of Disney's synergy efforts to the building of strong social relationships, a shared understanding of Disney's related businesses, and a common corporate context among his senior business leaders (Wetlaufer, 2000). This, in turn, makes it possible for Disney's business-unit managers to initiate a variety of collaborate linkages among themselves, resulting in different collaborative relationships for different products that shift over time.

Similarly, in a profile of OfficeSys (a pseudonym), Eisenhardt and Galunic (2000) describe OfficeSys' evolution from two to four related businesses (fax, photocopier, optical scanning and data transfer). During this evolution the businesses engaged in a variety of shifting linkages, from sharing manufacturing and production activities during an early period of hyper-competition, to exchanging engineers to facilitate the launching of two new businesses, and finally to joint advertising to promote a common brand. Each of these linkages was formed to capture potential synergies and, after the value of these synergies dissipated, was discontinued. In these cases, collaborative linkages among business-units were initiated and maintained when they created value

for each of the business-units. This is in contrast to a more traditional view of the corporate parent as being the best judge of business unit-linkages. In addition, in these cases, cross-business synergies were made possible by a corporate strategy of related diversification and the maintenance of a decentralized organizational form that attempted to bring "the market inside" the corporation by facilitating the coexistence of both collaboration and competition among the business-units.

In summary, recoupling is limited theoretically and the empirical evidence that exists is mostly anecdotal. Still, several observations can be made from the literature. First, there is evidence that the social and cultural context among managers may be an important factor in the capability of managers to effectively from and release linkages among business-units. Accordingly, it can be argued that decentralizing the choice of which linkages to form, from the corporate center to managers in the businesses, may also be important. Likewise, managing the number of linkages that are maintained can also be important, as it may be possible to be either over-linked, and as a result incurring high coordination costs relative to the benefits being derived, or under-linked, and therefore not realizing potential synergies from related resources in sister business-units.

Patching. Patching is the corporate level processes of "adding, splitting, transferring, exiting, or combing chucks of businesses" whereby corporate executives remap or reconfigure the businesses of the multi-business firm to changing market opportunities (Eisenhardt & Brown, 1999,: 74). These strategic moves differ from traditional reorganizations in that they are include small frequent changes and not just large ones (Galunic & Eisenhardt, 1996; 2001).

Patching creates cross-business synergies in two important ways: First, patching creates inter-temporal economies of scope by putting under-utilized (or under-realized) value-creating resources to their most productive use, and thereby creates growth opportunities that are unavailable to single-business competitors (cf. Helfat & Eisenhardt, 2001). Second, patching creates a form of market power, by creating opportunities for strategic advantages from resource transfers and

recombination that would take a long period of time for competitors to imitate.

For example, in a case study of patching (termed business-unit "charter change") of a multi-national firm in a high-velocity environment, Galunic and Eisenhardt (1996; 2001) observed that cross-business synergies were realized through a process that included internal competition for business-unit charters, transfer of charters to create better business-unit focus, and correction of misalignments between evolving markets and business-unit skills and culture. Moreover, they identified a few simple rules that were part of the process and some aspects of organizational context that were critical elements in the ability of managers to effectively shift charter assignments and knowledge-based resources between divisions without unproductive resistance. In addition, they observed that related technological bases of knowledge, and similar research and production processes, were essential pre-conditions to the process of making charter changes between divisions.

In contrast, in their historical study of the semiconductor photolithographic alignment equipment industry, Henderson and Clark (1990) observed that managers in this industry were unable to recombine existing component knowledge into new generations of products with different architectural configurations. The authors suggest that the existing knowledge and information-processing structures in each of the firms had evolved to match architectural characteristics of the existing products. Thus, the embeddedness and separation of these structures made them difficult to change to meet new and evolving market realities. These findings suggest that the ability to recombine knowledge into new products and services may not always occur, and so explicit management and/or structural changes, like those that are a consequence of patching, may be necessary over time to realize value from strategies of related diversification.

Despite these insights, patching remains limited theoretically and empirically, with only a few studies in the literature that describe the characteristics of this process. However, several

observations can be made. First, studies of patching highlight the importance of simplicity and loose coupling in dynamic markets. Just as it is possible to have to many or two few linkages in recoupling, so it is also possible in patching to have too many rules or rules that are too complicated (or no rules at all). Second, regularly pursuing synergies among related businesses may be an important factor in maintaining a sufficient level of contextual similarity (e.g., knowledge, process and work practices) to realize synergies from strategies of related diversification over time.

Overall, there are several observations that can be made from the process literature that is related to synergy. First, there has been some recent progress on identifying process as an important source of synergy, particularly in dynamic markets and in relation to knowledge-based resources. In particular, we describe three corporate level processes that are an important source of synergies: knowledge transfer, recoupling, and patching. Second, the knowledge transfer literature has provided a good understanding of knowledge, and the structures and processes by which knowledge-based resources are transferred. However, this literature is still relatively static in nature. Moreover, the knowledge transfer strategy literature also pays little attention to how the ability to transfer knowledge may often be grounded in social experience. Finally, processes of recoupling and patching are intriguing, but still remain very limited in theory and empirical demonstration. Therefore, findings are provisional at this point.

Finally, a broader comparison of process as a source of synergy with the other three sources of synergy (i.e., economies of scope, market power, and internal governance advantages) suggests the following observations. First, in comparison to internal governance advantages, the process perspective focuses on innovation and recombination as a source of value rather than monitoring and incentives. Likewise, it extends the resource allocation arguments from a focus on financial resources to one that includes knowledge and other intangible resources. Second, in comparison to economies of scope and market power, a process perspective provides insight into how advantages

from these other sources of synergy are actually obtained. Consequently, the literature that addresses process as a source of cross-business synergy in dynamic contexts counterpoints Williamson's (1975; 1993; 1996b) transaction cost arguments for the existence of the corporation by relying on a growth (not efficiency), and a process (not structural) perspective.

DISCUSSION

This paper explores the extant literature and key questions regarding cross-business synergies. We approached this exploration by conducting an extensive review of the extant theoretical and empirical literature related to cross-business synergies and more broadly, the existence of corporate effects. Specifically, we examined the strategy, organizational theory, economics, and finance literatures to ascertain how these literatures address the existence and realization of corporate value.

We found that, while the research domain is large and diverse, it has yet to generate a set of consistent and generalizable empirical findings. While the definition and some sources of synergy in the multi-business firm are clear, debates still persist regarding the importance of synergies to performance, the processes of synergy realization, the nature of relatedness among resources, and how synergy is affected by market dynamism. Moreover, even where theory exists, empirical work is often minimal. Consequently, the understanding of cross-business synergies and especially their actual realization in dynamic and in knowledge-based markets remains limited. In particular, we have several key observations.

First, there is persuasive evidence in the research on diversification and on variance components of performance that synergies (and dissynergies) exist. This provides support for the existence of corporate effects and supports the value of the corporation. Related diversifiers out-perform their single-business competitors, indicating that there are important corporate effects on firm performance. In particular, the existence of a corporate effect suggests that corporate strategy

can play a pivotal role in overall firm performance. The performance of the corporation is not due solely either to a particularly attractive industry structure or to the sum of individual business-unit performances.

Second, there are four primary sources of cross-business synergies: economies of scope (spreading costs), market power (keeping prices high), internal governance advantages (internal efficiencies relative to market) and recombinative processes (realigning corporate resources to capture value more effectively). Specifically, it is clear that economies of scope are an important source of potential cross-business synergies. However, much of the empirical literature is limited by a narrow conception of relatedness, often focusing only on the production function, and thus misses other important aspects of relatedness and complementarities along the value chain activities that can also create synergistic value. While arguments for market power and internal governance advantages as sources of synergy are theoretically promising, with the exception of multi-point competition, they have received little systematic empirical study in multi-business firms. Moreover, there may be additional ways of engaging in coordinated action beyond those described in the literature. Thus, broader conceptions for the sources of market power and internal governance synergies seem in order. Finally, recombinative processes are an intriguing inter-temporal source of synergy, especially in dynamic markets and where fungible resources like knowledge are particularly important. However, there still remains little systematic research on the processes by which multi-business organizations achieve synergies.

Third, we identified three interrelated corporate-level processes that become particularly salient as market dynamics increase: *knowledge transfer*, the movement of knowledge among business-units; *recoupling*, the changing of the web of business-unit collaborations (including knowledge transfer); and *patching*, the reconfiguring of business-units and their charters to address changing market opportunities. These coevolutionary processes are attempts to bring "the market

inside" the corporation, and thereby facilitate the coexistence of collaboration and competition among businesses. In addition, organizational factors like autonomy, relatedness and strong incentives may provide a context that enables business-unit managers to effectively engage in these processes. This kind of organization (in effect, a complex adaptive system) may also help managers maintain their focus on changing market opportunities, while at the same time allowing them to selectively take advantage of resource sharing and coordination opportunities. The resulting efficiencies and growth opportunities, which are not available to single-business or unrelated diversifiers, thus create the synergy. However, while these arguments are conceptually appealing, the research base (especially in high-velocity markets, and for recoupling and patching) remains limited. In addition, the nature and dynamics of governance roles remains largely unexplored in this source of synergy.

Fourth, synergies are context dependent. That is, factors like rate of market change are important in determining the sources and processes by which potential synergies might be realized. Physically-based resources (e.g., facilities, equipment, location) are most relevant to achieving economies of scope in relatively stable market situations where strategic advantages are more long-lasting. In contrast, knowledge-based and other intangible resources (e.g., brand) are more fungible than physical resources, and consequently become more relevant as market dynamism increases. This suggests that the degree of market change may affect the strategic resource logic of cross-business synergy realization.

Fifth, the realization of economies of scope, market power, and governance advantages must be managed (i.e., their realization does not happen automatically). Moreover, it is clear that similar management style and organizational context among businesses facilitates the sharing and transfer of resources among them. There is, however, still significant debate as to the types of organizational arrangements (e.g., autonomy verses centralization, strong verses weak incentives)

that managers of related-diversified firms should implement to achieve synergies.

Finally, traditional economic, finance, strategic, and organizational perspectives view synergy within corporations as resulting from efficiencies that are realized over the market through economies of scope, market power and internal governance advantages. These views focus on how synergies can create a sustainable competitive advantage, a static view of synergy realization that is mature theoretically, but still remains somewhat equivocal empirically. A fourth and emerging process view of synergy takes a more dynamic perspective. This perspective views synergies as resulting from processes of resource recombination over time. In particular, this view focuses on how synergies can create value through growth, recombination and adaptation, a dynamic view of synergy that is still forming theoretically and empirically.

Taken together, these observations suggest new research directions that focus on how cross-business synergies are achieved, especially in dynamic market contexts. They also suggest new research directions that focus on corporate level processes, corporate governance, and, more broadly, entrepreneurship within the corporation in order to capture shifting opportunities. These issues are explored through a multiple-case study of cross-business synergy realization in six global multi-business software firms, which is the subject of the following chapters in this dissertation.

FOOTNOTES

(1) Of the earlier studies that find few corporate effects (and/or business unit effects), they often included single-business firms in their analysis – for which no corporate effects would be observed. Likewise, some early studies focused exclusively on manufacturing companies, which according to McGhann and Porter (1997) have some of the lowest observed corporate effects. Consequently, there are often sampling and statistical issues in these studies with regard to the specific measurement of corporate effects.

(2) The corporate-parent effect is defined by common tendencies in the performance of a corporation's segments. This definition may lead to some counterintuitive implications. For example, if the various businesses of a corporation have similarly high profits, then a high corporate-parent effect will be registered even if the high profits were not specifically attributable to intervention by corporate headquarters. Conversely, the method does no fully capture the influence of corporate headquarters that intervenes to improve the performance of just a few member businesses. Defined in the particular manner adopted in this literature, then, the corporate parent effect may have little relationship to the true economic influence of corporate headquarters" (McGahan & Porter, 1999,: 25). Bowman and Helfat (2001) also expand on this point and likewise suggest that corporate-effects studies do not fully reflect the influence of corporate strategy on performance.

(3) Corporate influence results from multiple factors associated with membership in a multi-business organization that include corporate strategy, corporate management, scope, planning and control, organizational structure, organizational climate/culture and competencies and resources (e.g., see Bowman & Helfat, 2001).

Table 1: Do Cross-Business Synergies Exist? Selected Studies

Article	Topic	Sample	Method	Dependent Variable(s)	Findings
Rumelt (1991)	Performance effects	Manufacturing: 1974 –1977	Variance Components model	Variance in performance: ROA	Business-unit effects and Industry account for 73% of explained variance; Little Corporate effect found
Roquebert, Phillips and Westfall (1996)	Performance effects	Firms with at least 2 segments: 1985-1991	Variance Components model	Variance in performance: ROA	Existence of a corporate effect (18%) not previously detected is presented.
McGahan and Porter (1997)	Performance effects	Cross-industry: 1981-1994	Variance Components model	Variance in performance: ROA	Significant industry differences in degree of corporate effect
McGahan and Porter (1999)	Performance effects	Cross-industry: 1981-1994	OLS regression	Variance in performance: ROA	Validated previous results. Corporate and business-unit effects erode over time
Brush and Bromily (1997)	Performance effects	N/A	Monte Carlo simulation	Magnitude of variance component	If corporate only affects some business units, then models will under-estimate effects
Brush, Bromiley and Hendrix (1999)	Performance effects	Multi-business corporations 1986-95	Standard simultaneous equation model	Business unit ROA	Corporate parentage matters as much or more than industry (1.7X). Business segment still most important.
Palich, Cardinal and Miller (2000)	Diversification	82 case studies of the diversification -performance linkage	Meta-analysis	Accounting and market based correlations	Found and inverted “U” shaped relationship in the relationship between level of diversification and performance.

Table 2: Sources of Synergy – Selected Studies of Economies of Scope

Article	Topic	Sample	Methods	Dependent Variable(s)	Findings
Bettis (1981)	Diversification - performance	80 Diversified firms	Statistical analysis	ROA	Related firms outperformed unrelated firms by 1 to 3 percentage points
Davis and Thomas (1993)	Diversification - performance	Pharmaceut-icals: 1960-1980	Regression; Maximum quasilikli-hoods	Market Value; New Chemical Entities	Production relatedness did not imply synergy. Patterns of synergy for different types of relatedness shifted over time. Dissynergy results when transaction costs outweigh benefits.
Palich, Cardinal and Miller (2000)	Diversification - performance	82 case studies	Meta-analysis	Accounting and market based correlations	Found and inverted "U" shaped relationship in the relationship between level of diversification and performance.
Christensen and Montgomery (1981)	Diversification - performance	128 firms from Rumult's (1974) study	Statistical analysis	Divers Strategy Market Structure	Performance differences were found to exist among some, but not all, of Rumelt's categories
Markides and Williamson (1996)	Diversification - performance	136 of 457 large firms in non-financial / service industries in 1988.	Regression analysis	Performance ROS	Related diversifiers will outperform unrelated firms when similar types of accumulated assets are important. Performance as inverted 'U' shape
(Johnston, 1956; 1958)	Diversification - performance	Transportation industry (UK)	Case study	N/A	Inverted-U shaped relationships often observed as L-shaped in

					practice
Larrson and Finkelstein (1999)	Organizational context	61 M&A's studies over 30 year period	Case survey method & LISREL 7	Synergy realization	Relatedness, complementarities, integration processes and similar context leads to synergy realization
Hitt, Hoskisson and Hicheon (1997)	Organizational context	295 manufact-uring firms with sales over $100 million between 1988-1990	Regression analysis	Performance ROA	Ability to manage diversification critical and not readily imitable. International diversification has a curvilinear relationship with performance
St. John and Harrison (1999)	Relationships among resources	466 diversified manufacturing firms 1986-1992	Multi-method using both qualitative and quantitative data	ROS	Manufacturing-based relatedness leads to synergies. However, use of administrative controls essential.
Stimpert and Duhaime (1997a)	Relationships among resources	174 CEO's of fortune 1000 companies	Factor analysis and correlations	N/A	CEO's perceive relatedness to be due to org. factors (differentiation & marketing) as well as product / production factors

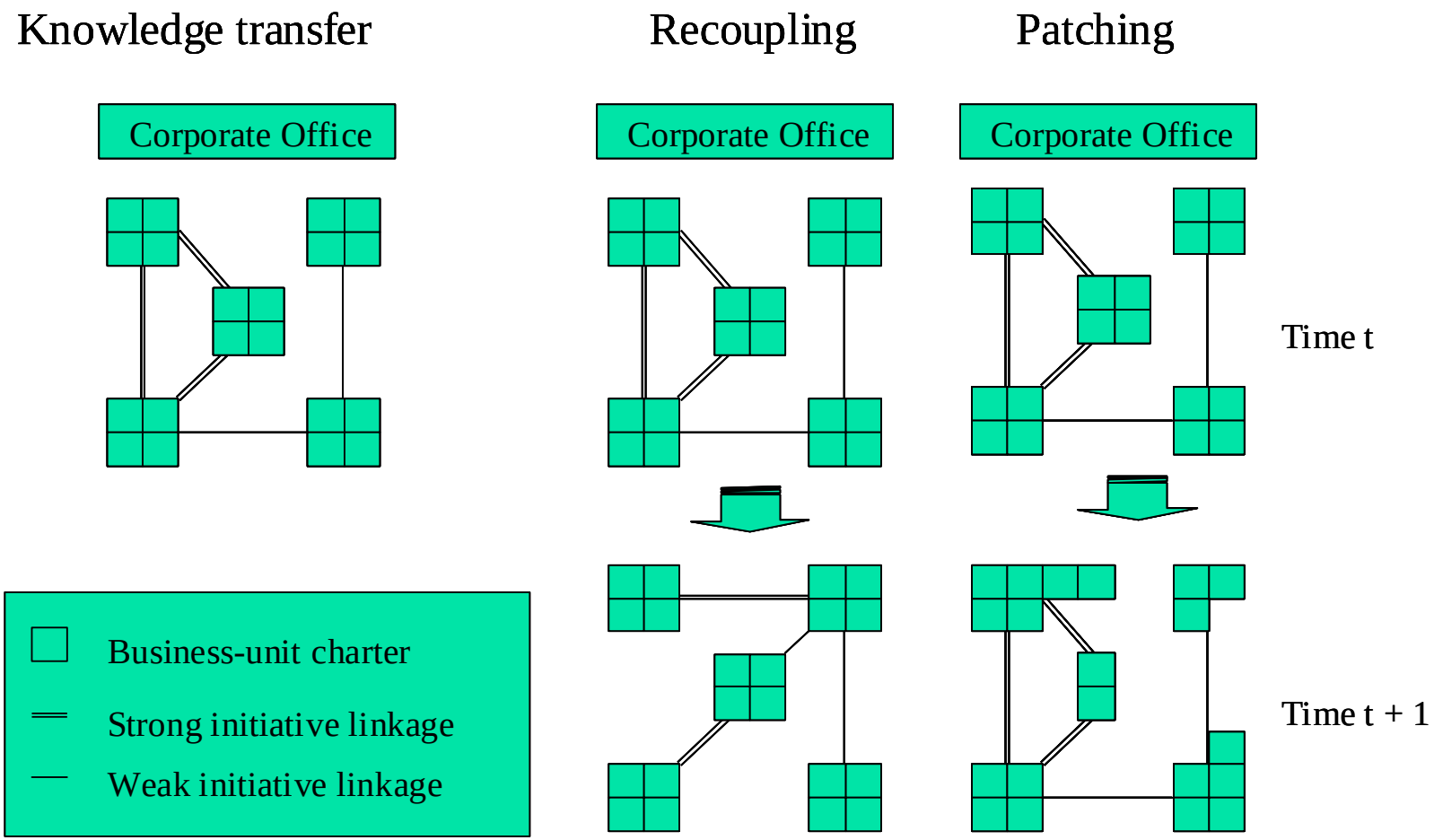
Table 3: Sources of Synergy – Selected Studies of Market Power

Article	Topic	Sample	Methods	Dependent Variable(s)	Findings
Karnani (1985)	Multi-point Competition	Multiple Industries	Case studies	Moves	Reasonable alternative lead to mutual foothold equilibrium
Bernheim and Whinston (1990)	Multi-point Competition	N/A	Econometric analysis	Economic benefit	Differences in markets, firms, or returns to scale important.
Evans and Kessides (1994)	Multi-point Competition	Airlines: 1984-1988	Time-series and cross-sectional analysis.	Fare Price: Contact.	Support for the mutual forbearance hypothesis
Smith and Wilson (1995)	Multi-point Competition	Airlines: 1983-1984	Logistic regression and factor analysis.	Entry; Response	Resource constraints may limit set of strategic options available
Hughes and Oughton (1993)	Multi-point Competition	Manufacturing (UK): 1979	Statistical analysis	Margin; ROI	Margins and rate of return on capital higher in industries with higher multi-market contact
Baum and Korn (1999)	Multi-point Competition	Airlines: 1979-1984	Pooled time-series cross sectional analysis.	Entries; Exits	Inverted U-Shaped relationship between entry, exit and multi-market contact.
Korn and Baum (1999)	Multi-point Competition	Airlines: 1979-1984	Pooled time-series cross sectional analysis.	Creation and Expansion of multi-market contact.	Relationship between multi-market contact and mutual forbearance are complicated and emergent
Gimeno and Woo (1999)	Multi-point Competition	Airlines: 1984-1988	Fixed effects intercept model	Efficiency Rivalry Profitability	Multi-market contacts and resource sharing are positively related.

Table 4: Processes of Cross-Business Synergy – Selected Studies

Article	Dynamic Process	Sample	Methods	Dependent Variable(s)	Findings
Zander and Kogut (1995)	Knowledge transfer	35 innovations in 20 Swedish firms 1960 to about 1986.	Survey questionnaire and hazard rates.	Probability of transfer or imitation	Codifiability and teachability are associated with faster transfer, but not imitation. Key employee turnover associated with faster imitation in industry
Szulanski (1996)	Knowledge transfer	122 best-practice transfers in eight companies.	Survey, canonical correlations.	Stickiness	Major barriers to internal knowledge transfer are lack of absorptive capacity, causal ambiguity, and weak ties.
Hansen (1999)	Knowledge transfer	120 new projects in electronics company	Network analysis	Completion time	Weak inter-unit ties facilitate search but impede the transfer of complex knowledge (strong tie needed)
Lorenzoni and Lipparini (1999)	Knowledge transfer	3 Italian manufacturers	Longitudinal study: 1988-1995	Alliances	The ability to integrate knowledge residing both inside and outside the firm's boundaries is distinctive capability (relational capability)
Pisano (1994)	Knowledge transfer	23 pharmaceutical projects in 11 companies	Regression analysis	Completion time	Learning by doing advantageous in developing organizations or dynamic environments, while learning before doing advantageous in mature organizations.
Brown and Eisenhardt (1997)	Recoupling	Six firms in the computer industry during 1993-1995	Comparative case study	Product portfolio performance	Successful firms: have limited structure and extensive communication
Galunic and Eisenhardt (1996; 2001)	Patching	80 informants in single high tech organization	Cross sectional analysis	Charter loss	Divisions primarily compete within a fluid "economy of charters" (p. 279) for opportunities, and secondarily for financial resources.

Figure 1: Corporate-Level Processes of Synergy Realization



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