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**RECREATING AND EXTENDING
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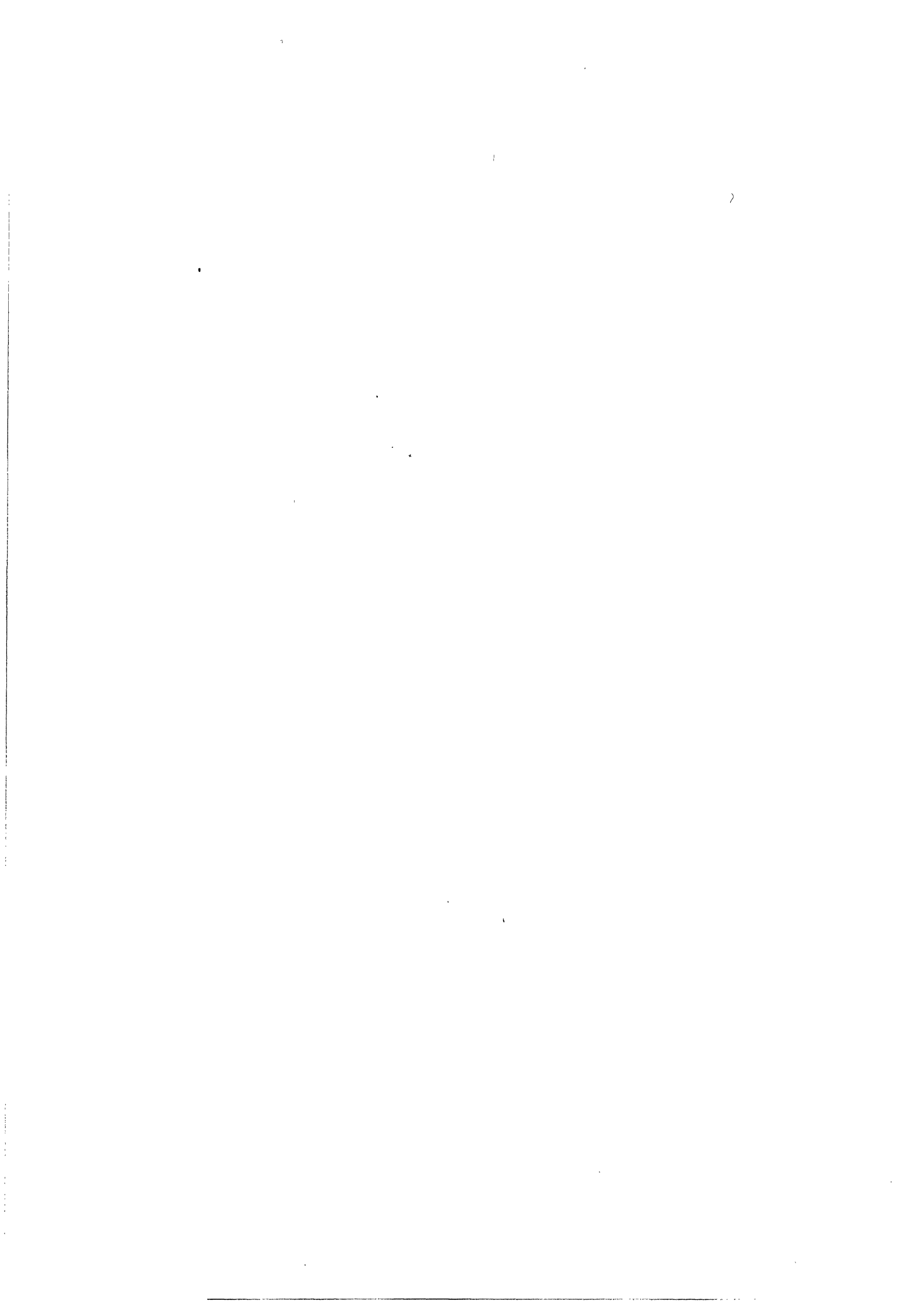
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RECREATING AND EXTENDING BUYER-SUPPLIER LINKS FOLLOWING INTERNATIONAL EXPANSION

ABSTRACT

Interorganizational networks are changing at increasing speed as commercial and noncommercial organizations span industries and continents. Existing studies of interorganizational networks have paid little attention to changes in organizations' external networks that take place following environmental change. Drawing on several organizational and economic perspectives, we develop propositions concerning incentives for buyers and suppliers to undertake two types of network reconfiguration following international expansion, recreation and extension of home-country buyer-supplier links. By recreation, we mean a case in which a supplier and an assembler with an existing relationship in the home country establish a buyer-supplier relationship in the new location. By extension, we mean a case in which a home-country supplier that does not sell components to an assembler at home becomes a supplier in the new location. The discussion is meant as a starting point for empirical research that will increase understanding of the particular case of buyer-supplier network reconfiguration. Addressing the interorganizational factors underlying link recreation and extension also is a first step toward a more comprehensive analysis of network reconfiguration.



RECREATING AND EXTENDING BUYER-SUPPLIER LINKS FOLLOWING INTERNATIONAL EXPANSION

Business firms and other types of organizations are embedded in networks of external agents that include suppliers, customers, regulatory bodies, and trade associations. Indeed, we generally recognize that organizations must create a network of external relations in order to survive (Stinchcombe, 1965; Freeman, Carroll, and Hannan, 1983; Miner, Amburgey, and Stearns, 1990). Organizations that create particularly effective external networks have strong competitive advantages (Pfeffer and Salancik, 1978:113-187; Stearns, Hoffman, and Heide, 1987; Fombrun, 1988; Nohria and Eccles, 1992:4-13). However, networks and environments are dynamic. When environmental changes occur, successful organizations that wish to continue to prosper must reconfigure their existing external networks by adding new agents and possibly severing ties with traditional partners. Existing studies of interorganizational networks have paid remarkably little attention to changes in organizations' external networks (Leik, 1992).

In this paper, we identify incentives for home-country assemblers and component suppliers to establish supply links in foreign locations. We consider two types of links between assemblers and suppliers operating in the foreign location. First, we refer to a case in which a supplier and an assembler with an existing relationship in the home country establish a buyer-supplier relationship in the new location as "recreating" a buyer-supplier link. Second, we refer to a

case in which a home-country supplier that does not sell components to an assembler at home becomes a supplier in the new location as "extending" a buyer-supplier link. Recreating buyer-supplier relationships in a new environment allows the firms to draw on established relationship-specific skills (Asanuma, 1989). Forming an extension link allows the firms to draw on country-specific skills when there are systematic differences in buyer-supplier relations among firms based in different nations (see Kogut, 1991). Recreating and extending supply links are two important means by which firms can adjust to the major environmental changes encountered during international expansion.

The paper addresses a specific type of network dynamics in order to provide insights on the general issue of how external networks change when environments change. Three aspects of our focus are especially noteworthy. First, we consider a particular type of environmental change, international expansion of firms. This is an empirically important issue that has intrinsic interest and contributes to a more general understanding of network reconfiguration. Second, we address changes in buyer-supplier networks. More broadly, a firm's external network will include many other types of organizations, including links with end-product users, competitors, and regulatory authorities (Whetten, 1981) that, together, comprise the economic organization of production (Tichy, Tushman, and Fombrun, 1979; Ghoshal and Bartlett, 1990). Buyer-supplier links constitute a central subset of the overall network. Third, we consider recreation and extension links, while omitting discussion of vertical integration, local suppliers, and importing that would form part of a full-scale description of buyer-supplier reconfiguration. Recreation and extension highlight key central issues concerning

the difficulty of reconfiguring a network to take advantage of past links. Addressing the interorganizational factors underlying buyer-supplier link recreation and extension following international expansion is a first step toward a more comprehensive analysis of how buyer-supplier networks and other external networks change when environments change.

To develop a theoretical framework for the discussion, we draw from the broadly defined literature concerning interorganizational relations and from more specific studies of assembler-supplier strategy. These literatures provide a rich nexus from which to explore interorganizational strategy. Reconfiguration of links between vertically-linked organizations such as buyers and suppliers is an understudied form of strategic behavior (Pennings, 1981:434; Leik, 1992). Identifying factors that influence recreation and extension of supplier links in the new environment is a direct contribution to our understanding of the dynamic nature of interorganizational networks.

We motivate the discussion with the empirical example of Japanese auto assemblers and suppliers that are establishing manufacturing facilities in North America. This topic is now generating substantial political controversy and strategic interest (Economist, 1992). The entry of Japanese automobile parts suppliers into North America is sometimes blamed for the poor performance of North American parts suppliers. At the same time, though, some view the changes as positive for the North American economy (e.g., Gelsanliter, 1990). Florida and Kenney (1991), meanwhile, provide evidence of an extensive transfer of Japanese automobile industry organization to North America. Hence, recreation and extension of Japanese assembler-supplier relationships in North America can have

both positive and negative influences on the practices and performance of North American assemblers and suppliers. Thus, the case both raises intrinsically important issues and provides an example of the general issue of network reconfiguration.

RECREATING AND EXTENDING JAPANESE AUTO COMPONENT SUPPLIER-ASSEMBLER NETWORKS IN NORTH AMERICA

The empirical case of the Japanese auto industry describes the concepts of recreation and extension and illustrates their importance following the international expansion of manufacturing firms. Effective management of assembler-supplier relationships is a source of competitive advantage for many Japanese auto manufacturers (Lyons, Krachenberg, and Henke, 1990; Cusumano and Takeishi, 1991). Automotive manufacturers tend to focus on overall automobile system design and final assembly, while relying on suppliers to carry out low cost production and innovative design of most components. External purchases account for about 70% of the value of the parts used by Japanese motor vehicle assemblers (Odaka, Ono, and Adachi, 1988: 54). Each Japanese auto assembler purchases components directly from about 200 of the 500-700 available "first-tier" suppliers (Dodwell Marketing Consultants, 1990; Turnbull, Oliver, and Wilkinson, 1992). In turn, first-tier suppliers subcontract part of the production to "second-tier" and "third-tier" suppliers that often specialize in particular products or manufacturing processes. The relationships between assemblers and first-tier suppliers often continue for many years (Helper, 1987, 1991).

Long-term relationships are needed to govern many buyer-supplier links because short-term contracts do not allow companies to develop the knowledge and trust that is needed to secure an efficient partnership and coordinate activities between partners (Cusumano, 1985; Heide and Miner, 1992). Complexity in the interactions between components interferes with attempts to acquire components through simple arms length transactions (Mitchell and Singh, 1992). Instead, the boundaries between many assemblers and suppliers are becoming increasingly blurred. For example, many product development responsibilities are now shifting from assemblers to suppliers (Womack, Jones, and Roos, 1990; Clark and Fujimoto, 1991).

By 1990, eight Japanese-owned assemblers had set up automobile manufacturing "transplant" operations in North America, either as wholly-owned operations or as joint ventures. The assembly transplants face a difficult challenge in North America -- to replicate supplier management practices that contributed to their success in Japan, while adapting to the new environment. Such practices can be viewed as a set of tacit organizational routines that are critical to current competitive advantage (Nelson and Winter, 1982:14-19; Cusumano and Takeishi, 1991), yet difficult to transfer across operations (Teece, 1977, 1982). Forming a supply network to serve a facility operating in a new location is both costly and difficult.

One attractive solution to the problem of replicating supply management practices in a new location is to purchase goods from the same suppliers that supply a firm's home-country facilities. Such recreation of supply links may ease an assembler's transition into foreign manufacturing by preserving as many

existing supplier management routines as possible (Mitchell, Shaver, and Yeung, 1992). In some cases, it will be possible to import components from existing suppliers' domestic facilities, but transportation costs, logistic complexity, and local production laws will often limit this option. Therefore, an assembler may need to buy goods from a supplier operating in the new location (Lamming, 1990; Blenkhorn and Banting, 1991). Assemblers often benefit if existing home-country suppliers establish facilities in the new location.

Nonetheless, there are substantial tradeoffs between recreating existing links in a new country and forming ties with new suppliers. On the one hand, existing suppliers have contributed to past competitive success and will often have knowledge that is relevant to current competitive needs. Conversely, the assembler's manufacturing facility in the new location may not provide sufficient volume for a traditional supplier to set up a new plant. Moreover, new suppliers may understand the new operating environment better than traditional suppliers. International expansion by a single firm creates difficulties owing to complex organizational structures and cultural diversity (Hofstede, 1980; Caves, 1982; Kogut and Singh, 1985). The difficulties are compounded when several suppliers must expand along with an assembler, because the complexity of expanding a supply network will increase with the number of organizations within it. Owing to the conflicting incentives and limited resources, an expanding assembler is likely to recreate only some of its existing links in the new location, while forming some links with new suppliers operating in the new location.

When an assembler chooses not to recreate an existing supply link with a domestic partner, and chooses instead to search for a new supplier in the new

location, other domestic suppliers that have set up facilities in the new country may be particularly desirable partners. Such companies may provide advantages over locally-owned suppliers if there are systematic differences in operational and financial aspects of buyer-supplier relations among firms based in different countries. As we noted earlier, we refer to cases in which new companies from the home country are added as suppliers in the new location as extending domestic supply links. If country-based differences exist, assemblers may form extension links rather than buy components from foreign firms. From the point of view of suppliers, meanwhile, extension links may provide additional volume for component manufacturing facilities set up in order to recreate links with assemblers.

In our empirical case, Japanese-owned motor vehicle assemblers and component suppliers have recreated and extended relationships with many Japanese-owned suppliers in North America. At the same time, though, many potential links remain unformed. Of about 679 first-tier suppliers in Japan identified by Dodwell Marketing Consultants (1990), 173 suppliers had established manufacturing facilities in North America by 1990 (ELM International, Inc., 1991).

Identifying the factors that influence the extent to which links are recreated and extended is an important strategic and political issue. Understanding Japanese supply management practices is necessary if we are to understand and guide supply management practices that are now emerging in the North American and European auto industries. Cusumano and Takeishi (1991) document some convergence between North American and Japanese supply

management practices in the auto sector. On the one hand, transplant suppliers are establishing new relationships with North American suppliers, thereby diffusing Japanese supply management practices among them. On the other hand, recent attempts by North American assemblers to change supplier management practices are modelled to a large extent on the systems employed by Japanese assemblers and suppliers (Helper, 1991).¹ Thus, recreation and extension of supply links between Japanese-owned transplant automobile assemblers and component manufacturers represents both an opportunity and a threat to North American firms. If many Japanese-owned firms practice more effective supply management than their competitors, the North American firms will fail. At the same time, however, the Japanese-owned firms offer models from which to learn effective supply management techniques and partners with which to practice them. We will continue to draw on the auto sector example in the next section, where we discuss factors that will influence which extension and recreation links will be formed when firms expand internationally.

MULTIPLE THEORETICAL PERSPECTIVES ON INTERORGANIZATIONAL LINKS

Our purpose is to develop propositions predicting the likelihood that a firm will recreate links with its existing home-country partners or extend new links to transplant firms operating in the new location. We examine the issue from five broad theoretical perspectives. We draw on multiple perspectives because no one existing view provides an adequate framework from which to investigate the

complex interplay of factors involved in network reconfiguration issues. We have chosen perspectives that will produce empirically-testable predictions.

Assigning different factors to particular perspectives is somewhat arbitrary, but together the five views construct a useful platform on which to base propositions concerning recreation and extension incentives. First, the interorganizational experience perspective draws on concepts of trust, reputation, and learning to develop predictions concerning the duration of relationships between specific pairs of firms and each firm's aggregate interorganizational experience. Second, like the first perspective, the power-dependence perspective also raises issues concerning each firm's aggregate interorganizational experience. In addition, the power-dependence perspective addresses relative organizational size, degree of dependence on suppliers for particular components, and interfirm equity holdings and board representation. Third, the scale and scope perspective raises issues concerning assembler performance and history of supplier choices, and considers effects of individual and aggregate production volume of a supplier's customers. The production volume factors draw on the concept of within density, found within the network literature. Fourth, the transaction cost perspective raises issues of location-based transaction specificity. Finally, viewing assemblers and suppliers as organizational communities raises issues of multiple links among an assembler and its suppliers.

Within the five perspectives, the predictions encompass several levels of analysis. Some propositions stem from product-level characteristics of the goods exchanged between supplier and assembler. Some propositions address firm-level characteristics of individual assemblers and suppliers. Other predictions concern

characteristics of specific assembler-supplier pairs. In addition, some propositions view assembler-supplier relationships in terms of a hierarchical community, consisting of a principal buyer and its set of suppliers.

Overall, most propositions developed from the five perspectives are consistent with each other, and together form a complementary aggregate view of network reconfiguration. However, some propositions reflect opposing views on interorganizational power. The most striking contradiction is that the power-dependence perspective stands in opposition to more reciprocal views of interorganizational relations, leading to directly conflicting predictions in propositions 2 and 4. Eventual empirical tests will provide important insights concerning the relative strength of reciprocal and dominance theories of interorganizational relationships.

We emphasize factors that will be measurable from available data, so that the discussion will serve as a base for empirical research to test and extend the propositions. Although we present each proposition independently, empirical analysis will need to control for multiple individual and interactive effects. The propositions are summarized in Table 1.

TABLE 1 ABOUT HERE

Interorganizational Experience Perspective

Several scholars advocate an interactive approach to interorganizational relationships, rather than one based only on characteristics of the individual organizations (e.g., Cook, 1977; Levinthal and Fichman, 1988). According to an interactive approach, trust and commitment develop in the context of a specific pairwise (dyadic) relationship and are reinforced by ongoing interaction. The importance of ongoing interaction is emphasized in a recent study of relationships between 136 industrial buyers and suppliers, in which Heide and Miner (1992) found that buyer-supplier cooperation increased both with anticipated future interaction and with higher frequency of contact in the existing relationship. Similar arguments have been made for the efficacy of longer interorganizational relationships. For example, Stinchcombe (1965: 148-149) suggests that survival advantages accrue to older organizations that have established stable ties to their external network. Increasing duration in interorganizational relationships allows for the development of relationship-specific assets such as partners' knowledge of each other's routines, which may in turn lead to increased commitment. Fichman and Levinthal (1991: 453) argue that the "persistence of interfirm relationships can be viewed as the result of a sorting process in which firms are learning about each other."

Recreating assembler-supplier links likely reflects accumulated experience and associated reputational effects in specific interfirm pairs. Long-term economic relations often involve greater trust and the absence of opportunism (Granovetter, 1985; Williamson, 1985: 120-123). Therefore, we expect suppliers

and assemblers that are involved in relationships of greater duration in the home country to be more likely to recreate their relationship in the new location.

Proposition 1. The greater the duration of an existing relationship between an assembler and a supplier in the home country, the more likely the relationship will be recreated in the new location.

In a study of auditor-client relationships, Fichman and Levinthal (1991) suggest that potential clients will have more precise information about auditors that serve a large number of clients. Higher precision of information increases the likelihood of an appropriate match and can be viewed as an initial asset. Fichman and Levinthal found that auditors serving a larger number of clients in a specific client's industry experienced relationships of greater duration. Similarly, assemblers are likely to have more precise information about the capabilities of suppliers that cater to a larger number of assemblers. Further, supplier reputation that accumulates as a result of ongoing interaction with many buyers in the home country is likely to influence favorably assembler choices regarding partners in the new location. Therefore, suppliers that sell to a larger number of assemblers in the home market are more likely to establish manufacturing operations in the new location. Not only are such suppliers more likely to recreate their links with existing assembler buyers, but they are also attractive candidates for extension of supplier networks by other assemblers. Such reputational effects are likely to intensify in the future as suppliers become increasingly responsible for activities such as research and development, subcontractor management, paperless

accounting, customer-dedicated staff, and responsibility for warranty (Lamming, 1990: 655).

Proposition 2. The more assemblers to which a supplier sells components in the home country, the more likely the supplier will recreate any one link in the new location and the more likely the supplier will extend a link to any one new partner in the new location.

Power-Dependence Perspective

Propositions 1 and 2 assume that assembler-supplier relationships are based on norms of reciprocity and needs for stability in the face of environmental uncertainty associated with foreign expansion of assembler operations. A less sanguine view of assembler-supplier relationship formation would ascribe far greater importance to asymmetry in the ability of an organization to exert power or control over another organization or its resources (see Oliver, 1990: 243-246). According to the power-dependence perspective, assemblers will attempt to control suppliers that possess scarce resources, namely inputs into the assembler production process that satisfy established quality and cost standards and are only available from a few sources.

Power-dependence theories view organizations as open systems that must maintain a balance of resources and contributions in relation to their environment. The environment, in turn, consists of other organizations. An organization will become dependent on another organization to the extent that the latter controls resources which the first organization values, and for which alternative sources are not available. Specifically, dependence can be defined as "the product of the

importance of a given input or output to the organization and the extent to which it is controlled by a relatively few organizations" (Pfeffer and Salancik, 1978: 50). Whenever dependence is not reciprocal, the more dependent organization stands to lose in the exchange. The power of organization A over organization B, then, is definitionally equivalent to the dependence of B on A (Emerson, 1962).

A simple and frequently used measure of dependence is the size of an organization relative to its trading partners (Pfeffer and Salancik, 1978). For example, the smaller a supplier is relative to its customer(s), the more the supplier is dependent on its customer(s). In such cases, the buyer(s) may be able to transfer some of the risks of international expansion to the supplier by recreating existing supply relationships in the new location.

Proposition 3. If buyer power is a primary consideration, then the larger the size of a buyer relative to an existing supplier in the home country, the more likely the buyer and supplier will recreate their supply relationship in the new location.

An alternative measure of dependence is the number of assemblers to which a buyer sells goods in the domestic market. If power-dependence is an important issue, then suppliers that sell to few domestic assemblers in the domestic market may be more likely to recreate links in the new country because such captive suppliers will be very susceptible to demands by their domestic partners that they establish foreign operations. Proposition 4 is an alternative to the link recreation prediction within proposition 2.

Proposition 4. If buyer power is a primary consideration, then the more assemblers to which a supplier sells components in the home country, the less likely the supplier will recreate any one link in the new location.

In the power-dependence perspective, the relationship between network extension by a supplier and dependence of the supplier on a buyer is more ambiguous, no matter whether the dependence stems from relative size or captive status. A dominant buyer may discourage a dependent supplier from forming extension relationships with other buyers. From the point of view of a dependent supplier, though, extending its network of relationships to new customers may provide a means of shifting the balances of power and dependence in a specific relationship (Emerson, 1962; Pfeffer and Salancik, 1978; Leik, 1992). A dominant buyer may exert substantial control over a dependent supplier's actions in the home country, including the decision to set up a foreign operation. Once the supplier has expanded to the new location, however, the subordinate firm may have opportunities to establish a broader set of interorganizational relations. Although the assembler may discourage such extension, the foreign location may afford the supplier greater freedom of action than available in the old environment. In addition, new links may offer scale needed for economic justification of the expansion. These issues provide fruitful research questions for future research.

Vertical groupings of firms within industries, such as relationships between large firms and their subcontractors, also may create power dependence.

For instance, a prominent characteristic of Japanese industrial organization that motivates an explanation based on power-dependence is the grouping of firms in vertical enterprise groups (keiretsu) (Aoki, 1984; Abegglen and Stalk, 1985; Gerlach, 1992). Lincoln and McBride (1987: 307) characterize these relationships as being "highly asymmetric, even exploitative, transactions between corporate majors positioned at the core of the Japanese economy and their dependent satellites on the periphery." In this view, the subcontractors serve to buffer the parent firm from labor and product market uncertainties.

In support of the power-dependence view, some studies have found that affiliated firms are less profitable than nonaffiliated firms (e.g., Caves and Uekasa, 1976). For suppliers, such weaker performance may stem from low structural autonomy.² Low structural autonomy for suppliers may result from either of two reasons: 1) suppliers occupy positions that are affiliated with only a few other positions (assemblers) in the assembler-supplier network, and 2) the relationship between suppliers and assemblers is such that there is little competition among assemblers for the products of the suppliers (Burt, 1982: 266-273).

Such asymmetries between assemblers and suppliers may explain variations in the recreation of links that are specific to the supply of certain components. In their examination of sourcing strategies for four automobile parts -- shock absorbers, front seat assemblies, gauge (meter) assemblies, and instrument panels -- Cusumano and Takeishi (1991) found a high incidence of sole suppliers for particular parts among several Japanese assemblers both in Japan and in North America. Seventy per cent of the suppliers to Japanese

assembler plants in Japan were sole suppliers, while the comparable estimate for Japanese assembler plants in North America was as high as 83%. Florida and Kenney's (1991: 392) survey of 73 Japanese auto component suppliers with manufacturing facilities in North America revealed that "more than 75 percent set up operations in the U.S. to maintain close ties to a major Japanese customer." Links that feature reliance on a sole supplier of a specific part in the home country are more likely to be recreated in the new location.

Proposition 5. If buyer power is a primary consideration, then assemblers that expand into the new location are likely to recreate links with firms that are their sole suppliers for specific components in the home country.

Some assemblers may promote a policy of purchasing goods from two or more vendors, in order to encourage competition between suppliers and gain benefits in terms of reduced costs and improved quality (Williamson, 1985: 121). If the assembler is the dominant party in such relationships, one would expect firms that are one among many suppliers for a part or component to be more likely to establish manufacturing operations in the new location as the assembler carries out its multiple-vendor strategy. However, this association is likely to be mediated by economic scale considerations -- recreating assembler-supplier links is less likely if the number of suppliers in the home country is larger than a certain number. This suggests a nonmonotonic pattern linking the number of existing suppliers for a specific part or component in the home country and the likelihood of the relationship being recreated in the new location.

Proposition 6. If buyer power is a primary consideration, then the likelihood of recreating a buyer-supplier relationship in the new location will take an inverted-U shaped relationship with the number of suppliers from which an assembler purchases a specific component in the home country.

An alternative view of power-dependence relations would hold that a sole supplier, rather than its partner, has the stronger hand, especially if the goods could not easily be obtained from alternative sources (e.g., Williamson, 1975). The power of a sole supplier likely depends on how many assemblers it sells the good to. If there is only one customer for the good, so that the supplier and buyer are hostage to each other, then it is possible that the decision to undertake international expansion will be made jointly and link recreation will be relatively common. When a sole supplier sells the good to many assemblers, by contrast, each assembler will hold a weaker bargaining position. In such cases, the supplier might decide to export from the domestic location rather than establish facilities in the new location, in order to realize volume economies (economies of scale, scope, and learning) even at the expense of some logistic difficulty concerning ordering and delivery systems.

Proposition 7. If supplier power is a primary consideration, then the more buyers of a component to which a supplier is the sole source in the home country, the less likely any one buyer-supplier link will be recreated in the new location.

So far, we have considered networks in terms of one type of link, that is, sale and purchase of components. A second type of link occurs through the interpenetration of organizational boundaries of supplier and assembler firms. Laumann, Galaskiewicz, and Marsden (1978: 464) array such links along a continuum from common membership in a coalition of organizations (low degree of overlap) to shared memberships, especially of officers or directors (high degree of overlap). Often links based on boundary interpenetration arise out of a need to ensure the stability of links based on resource transfers. Aldrich and Whetten (1981: 391) argue that networks composed of organizations with multiple types of links are more likely to be stable. In our context, assembler-supplier networks with substantial interpenetration of organizational boundaries, such as through interfirm equity ownership or board membership, will tend to be recreated in a new environment.

Assemblers will often dominate recreation decisions based on boundary interpenetration when the downstream firms are larger and older than the upstream suppliers. In Japan, for instance, Lincoln, Gerlach, and Takahashi (1992: 569) argue that customer firms in many industries are more likely to own shares and place directors on the boards of supplier firms than vice versa. In the Japanese auto industry, suppliers with the closest ties to assemblers are often spun-off divisions (Odaka, Ono, and Adachi, 1988). Ultimately, a power-dependence differential among suppliers and assemblers is reflected in customer firms attempting to exert control over suppliers.

Equity ownership and director interlocks are two means by which customers may control suppliers.³ Assemblers that own equity in suppliers or

have directors on the boards of suppliers are more likely to succeed in ensuring that resource transfers will continue in the new manufacturing location. In the auto industry, Cusumano and Takeishi (1991: 570) find that affiliated firms (defined as 20% or more owned by the assembler) account for 25% (6 of 24) of the suppliers to Japanese assemblers in North America. The comparable figure in Japan was one third (9 of 27). Florida and Kenney (1991: 392) found that 12 of the 73 auto component suppliers in their study were partially owned by the assemblers they supply. At the same time, affiliated suppliers are less likely to extend supply relationships to other assemblers, partly because the primary assembler and other assemblers may fear leakage of proprietary design or technological knowhow through the supplier.⁴ These arguments suggest the following propositions.

Proposition 8. The greater the equity interest or number of board memberships that an assembler holds in a supplier, the more likely the relationship will be recreated in the new location.

Proposition 9. The greater the equity interest or board memberships that other assemblers hold in a supplier, the less likely that any one assembler and the supplier will form an extension relationship in the new location.

Scale and Scope Perspective

Assembler and supplier production volume also are likely to influence link recreation and extension. Scale economies result from producing more goods of the same type with the same fixed assets during a given time period. Similarly,

scope economies arise from producing more types of goods with the same fixed assets. Both scale and scope economies commonly occur at the plant level, rather than being a function of overall corporate size (Gold, 1981).

Odaka, Ono, and Adachi (1988: 268) argue that the use of exclusive assembler-supplier relationships in the Japanese automobile industry partly stems from the need to achieve scale economies in component production. Ghoshal and Bartlett (1990: 612-613) argue that a firm is more likely to minimize the number of locations in which it operates, and so maximize scale and scope economies, in cases where it sells goods to a low proportion of potential buyers in international locations. In the auto industry example, from this perspective, a Japanese supplier that sells goods to few of the assembly transplants now operating in North America is less likely to set up a North American manufacturing facility than a supplier that sells goods to many of the transplants. Instead, the supplier that sells to few assemblers is more likely to export to them from a central location. Ghoshal and Bartlett (1990) draw on the network literature concepts of "within density" and "across density" to describe the facilities location decisions of multinational corporations.

In the context of international assembler-supplier networks, within density is defined as the proportion of potential buyers in a particular location to which a supplier actually sells goods. When within density is high (i.e., a firm sells to a high proportion of potential buyers), firms tend to disperse different kinds of resources in each national market. Such dispersion allows them to conform to the structure of local organization sets, where an organization set comprises all the links related to a focal organization (Evan, 1966; Aldrich and Whetten, 1981:

386). By contrast, when the within density amidst a national organization set is low (i.e., the supplier sells to few of the potential buyers), the focal firm is likely to distribute its research, production, assembly, and other activities among several countries based on their comparative advantages (Ghoshal and Bartlett, 1990: 612-613). For example, Lamming (1990: 658) notes that Texas Instruments designs semiconductors in the U.S. (design and R&D expertise), manufactures base substrates in Singapore (low cost, medium quality), and undertakes final production in Japan (high quality, production expertise). In the auto industry case, if the within density of a Japanese auto supplier firm is low in North America, the firm is likely to maximize scale and scope economies by locating production in Japan and exporting to assemblers in North America. Conversely, when a supplier sells to most North American auto assembly transplants, it is likely to establish manufacturing operations in North America rather than export components to the transplants. Having established a manufacturing facility, the supplier will tend both to recreate and extend links with assemblers.

Proposition 10. The greater the proportion of home-country assemblers operating manufacturing facilities in the new location to which a supplier sells goods in the new location, the more likely the supplier will recreate any one link and the more likely the supplier will extend a link to any one new buyer in the new location.

In addition to within density, across density may also influence link recreation and extension. In the auto sector example, across density refers to commonality of a supplier's customers in Japan and North America. For a given

supplier firm, the across density of its external network is equivalent to the proportion of its customers (assemblers) that are common in the two national markets. When the across density in the customer network of a Japanese supplier is low (few common customers in Japan and North America), resource allocation decisions are likely to be made solely on the basis of within density considerations (Ghoshal and Bartlett, 1990: 613-614). When the across density is high (many common customers), resource allocation is influenced by characteristics of the customer network in the two countries. If product standards or preferences in North America influence customer behavior in Japan, for example, Japanese suppliers are likely to establish manufacturing operations in North America. In this case, the North American location serves as a central location in the supplier's customer network. The concept of a central location is analogous to the concepts of lead markets (Bartlett and Ghoshal, 1986; Prahalad and Doz, 1987) and key markets (Mitchell, Shaver, and Yeung, 1992). When a high proportion of a supplier's customers in the new location are also its customers at home, the supplier will tend to manufacture those goods in the new location for which the new market dictates standards or customer preferences.

In addition to the within and across density factors, several other scale and scope issues might affect recreation and extension. Assemblers with larger production volumes in the new location are likely to recreate their supplier links and to form extension links to a greater extent than other assemblers, given their greater need for components.

Proposition 11. The greater the output of an assembler in the new location, the greater the likelihood that the assembler will recreate its

relationship with any one supplier in the new location, and the more likely it will form any one extension link in the new location.

The order of entry among assemblers also is likely to influence their choice of suppliers. Early entrants will be most likely to need to attract their existing suppliers.

Proposition 12a. The earlier that an assembler enters the new location, the more likely it will recreate any one supplier link in the new location.

By contrast, assemblers that are later entrants to the new location may instead be able to extend their networks by including suppliers that are part of an earlier entrant's established network. Later entrant assemblers also may be unable to assure sufficient scale as an incentive for their own home-country suppliers to set up transplant component manufacturing operations.

Proposition 12b. The later that an assembler enters the new location, the less likely it will form any one extension link in the new location.

Extension and recreation incentives will change over time as an assembler gains experience in the new location. In part, the likelihood that it will form relationships with suppliers based in the new location will increase (Dunning, 1986). But whether the suppliers will tend to be owned in the home or host country is ambiguous.⁵ On the one hand, longer manufacturing experience of assemblers in the new location is likely to be associated with greater production

volumes and thus lead to greater recreation and extension of the home-country supplier network. On the other hand, an assembler with longer foreign experience will also have more time to create a local sourcing network and thus create links with new local suppliers.

The tendency to form links with locally-owned suppliers rather than transplant suppliers as an assembler gains experience in the new location will be influenced by the assembler's early choices. Assemblers that initially buy components from many locally-owned suppliers will gain experience that they can draw on to work with other locally-owned suppliers in later years. Assemblers that begin by obtaining most components from home country firms, whether by importing goods from home country suppliers or by recreating and extending links, will gain little relevant local experience and may continue to rely on recreation and extension in later years. Thus, the effect of an assembler's tenure in the new location will be mediated by its history of recreation and extension choices.

Proposition 13. The greater the proportion of transplant suppliers to total suppliers from which an assembler buys components when it first expands to the new location, the more likely it will recreate or extend any one link in the future. This tendency will become stronger as the assembler accumulates manufacturing experience in the new location.

The relative growth of an assembler's production volume in the new country and the home location also creates scale incentives for link recreation. If production growth in the new location outstrips growth at home, then its suppliers

will be more likely to migrate than if production in the home country continues to grow rapidly.

Proposition 14. The greater the growth rate of an assembler's production volume in the new location relative to its growth rate in the home country, the more likely that the assembler will recreate any one buyer-supplier link in the new location.

Similarly, an assembler's performance will influence supplier strategy. Galaskiewicz (1985: 286-287) points out that explanations for interorganizational relationships must account for environmental constraints on strategic choice. From an economic perspective, suppliers have incentives to set up new facilities to serve successful assemblers because the assemblers offer a reasonable chance of stable or growing demand. From an ecological perspective, variation in environmental resource abundance is likely to influence the choices available to organizations (Aldrich, 1979; Hannan and Freeman, 1989). In this view, suppliers are more likely to recreate links with successful assemblers than with faltering firms because strong assembler performance will be associated with firm-level resource abundance.

Proposition 15. The stronger an assembler's overall performance, the more likely that it will recreate any one buyer-supplier link in the new location, and the more likely the assembler will form any one extension link in the new location.

Transaction Cost Perspective

The propositions in the previous section suggest that a supplier's expansion decision is influenced by characteristics of its buyers. In addition, the incentives for recreating supplier-assembler links may stem from location-based transaction specificity concerning particular products. Location-based specificity (Williamson, 1975, 1988) stems from transactions that require close firm-specific interaction between partners for effective exchange to take place. In the manufacturing sector, benefits of buyer and supplier proximity arise in at least two circumstances. First, some goods require ongoing input from both supplier and assembler for component and system design. Second, assembly processes often require complex logistic support for just-in-time ordering and delivery systems (Heide and John, 1990). For instance, many firms that supply North American auto assemblers locate their facilities nearby, or even operate quasi-integrated manufacturing facilities located within their customers' plants (Monteverde and Teece, 1982).

Location-based specificity in the home location does not necessarily lead to location-based specificity in the new location, but there will tend to be a strong relationship between them. Goods that require joint design in one location might not require joint design at the new location, because the goods produced at an assembler's foreign transplant may use the same components as those produced at home. Even if design change is needed in the new location, other suppliers may be able to provide the needed skills. Similarly, for goods where location-based specificity stems from logistic support, it may be possible to develop appropriate interfirm systems with new suppliers near the transplant. Over time, however,

many interfirm design and logistic support systems tend to become idiosyncratic and difficult to replicate. When components in the new location require specialized design or logistic support, an assembler will benefit by working with the firms that supply it with similar components in the home market. This incentive will be strongest when high transportation costs or related barriers increase the incentives for local sourcing in the new location.

Proposition 16. The greater the location-based transaction specificity of goods being exchanged between a supplier and an assembler in the home country, the more likely the relationship will be recreated in the new location and the less likely that the supplier will form any one extension link. The influence will be strongest for goods involving high transportation costs or substantial design changes in the new location.

Organizational Community Perspective

Finally, one can view buyer-supplier networks as hierarchical communities of vertically-related organizations, rather than as sets of individual firms or pairs of firms (Astley and Fombrun, 1983). The automobile industry is commonly cited as an example of such communities. Fombrun (1988: 233), for instance, states that competition in the automobile industry occurs between "intricate networks of loosely coordinated suppliers, dealers, parts manufacturers, assemblers, data processors, advertising agencies, designers, and labor unions," rather than between individual assemblers or suppliers. In such cases, decisions made by any firm within the community may have far-reaching effects for all firms within the network, creating interdependence among the organizations.

Many types of interdependence between organizations may arise in such communities, ranging from mutually destructive to mutually beneficial (Hawley, 1950). We will address the case of positive interdependence, in which organizations tend to cooperate for mutual benefit (Astley and Fombrun, 1987: 176; Barnett and Carroll, 1987: 401-402). Positive interdependence tends to occur in communities where organizations possess complementary sets of resources. This commonly occurs in buyer-supplier networks, where the outputs of suppliers are inputs to assemblers and, in return, assemblers provide suppliers with financial and other vital resources such as design, engineering, and production knowhow. Mutually-beneficial buyer-supplier management practices such as the just-in-time deliveries, extensive exchange of information and personnel, and cooperation in product development described by Womack, Jones, and Roos (1990) and Clark and Fujimoto (1991) are examples of positive interdependence.⁶

Collective strategies are likely to emerge when a community is marked by positive interdependence, especially under conditions of resource scarcity (Laumann, Galaskiewicz, and Marsden, 1978: 461-462). Strategies are collective when the interests of other firms in the community are taken into account as part of each firm's decisions. Collective strategies may arise through conscious planning and coordination by a central firm (Lamming, 1990), or emerge through repetitive patterns of pairwise interorganizational activity (Dollinger, 1990: 269).⁷

From the organizational community perspective, the existence of a collective strategy means that the actions of any single firm are constrained by the

network structure made up of all links within the network. In a buyer-supplier network, these links include relations among suppliers as well as those between assemblers and suppliers. Suppliers at several tiers of the vertical community are likely to exchange goods with each other before passing components on to an assembler. In the following discussion, we use the term "community link" to refer both to cases in which an assembler purchases components from a supplier and to cases in which one supplier purchases subcomponents from another supplier.

The number of community links that exist in an assembler's supply network is likely to affect link recreation because networks comprising a given number of organizations become increasingly tightly-coupled as the number of community links rises. Following Simon (1962) and Weick (1979: 185-187), Aldrich and Whetten (1981: 388) argue that tightly-coupled networks find it difficult to adapt to environmental changes affecting any single member of the network.⁸ Therefore, the greater the number of community links within the network, whether between assembler and supplier or between two suppliers, the more difficult it will be to piece together the network in a new location.

Proposition 17. The more links that exist within an assembler's supplier community in the home country, the less likely that any one link will be recreated in the new location.

CONCLUSION

We have identified factors that may cause firms to recreate and extend buyer-supplier links following international expansion. We draw on multiple organizational and economic perspectives because no one existing view provides

an adequate framework from which to investigate the complex interplay of factors involved in network reconfiguration. Overall, the propositions form a multifaceted view of network reconfiguration. Empirical tests of the predictions will help distinguish among power-dependence and reciprocal explanations for interorganizational behavior. The propositions generalize to many cases of link recreation and extension, as well as to the more general issue of network reconfiguration following environmental change. Thus, the predictions have substantial empirical relevance.

In developing our argument, we draw on the case of Japanese automobile assemblers and component manufacturers, which raises important issues for corporate strategy and public policy. Japanese auto sector manufacturers have been accused of competing unfairly owing to a systematic preference for transplanted suppliers over local vendors. Some analysts suggest that the Japanese assemblers may reduce their reliance on link recreation and extension, instead buying more parts from North American suppliers, in order to defuse political tension (Cusumano and Takeishi, 1991). Though this might be a pragmatic step, we argue that it may not be sufficient to resolve current problems facing many North American suppliers. Where recreation and extension are seen by some observers as preferential treatment of Japanese suppliers by Japanese assemblers, these cases may merely reflect the importance of stable interorganizational relationships.

The issue of buyer-supplier link recreation and extension arises in many other cases of international expansion, both within the auto industry and in other sectors. American auto companies faced similar decisions when they expanded

their European manufacturing facilities (Vernon, 1971), for instance, as do European automobile manufacturers such as BMW that are now setting up North American manufacturing facilities. Similarly, some Japanese photocopier component manufacturers are now expanding to Europe as companies such as Sharp and Canon establish manufacturing facilities within the European Community. Equivalent cases have long arisen in service sectors, such as banking and advertising, as major clients and the firms that provide services to them have expanded internationally. Our propositions will guide further empirical research and explanation of such events.

The discussion has general implications for our broader understanding of network reconfiguration in changing environments. Most directly, our analysis addresses the evolution of vertical relations within hybrid organizations. Buyer-supplier networks can be viewed as vertically-defined hybrid organizational forms. Early discussions tended to classify hybrid organizations as intermediate forms, placed on a continuum between market and hierarchical organization (e.g., Williamson, 1975, 1985). More recently, we have recognized that networks and other hybrids represent a distinct form of economic organization, needing distinct systematic analysis (e.g., Thorelli, 1986; Jarillo, 1988; Luke, Begun, and Pointer, 1989; Powell, 1990: 297-299; Williamson, 1991).

Perhaps the most important direction for analysis of hybrid organizations is to examine how they change over time. Most studies of vertical relationships have focused on the make or buy decision, largely taking cross-sectional snapshots and underemphasizing the dynamic nature of the relationships. In contrast, theoretical and empirical analysis of the issues introduced here will help us

understand the evolution of relations between buyers and makers. Commercial and noncommercial networks now span industries and continents. As we increasingly recognize the prevalence of such networks, it is as at least as important to understand how they will change over time as it is to explain why they are created.

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NOTES

¹ Illustrating the importance of understanding Japanese supply management practices, Stertz (1992) describes changes in design, product development, manufacturing, supplier relations, and the work organization at Chrysler Corporation. These changes, which were modelled on a study of Honda Motor Co., reduced Chrysler's costs by approximately \$1 billion a year. Suggestions made by parts suppliers alone accounted for \$156 million in cost savings. Newly-adopted supplier management practices at General Motors also illustrate this convergence toward the Japanese model of assembler-supplier relationships. In 1992, General Motors requested suppliers to reduce prices by 3% in exchange for providing engineering and design assistance that would ultimately lead to cost reductions for suppliers. General Motors apparently saved at least \$150 million as a result (White, 1992). Internal operating divisions that account for 70% of the company's parts no longer have an advantage in supply contracts. General Motors has also adopted Japanese practices such as reimbursing suppliers for tooling costs over the life of the product as opposed to the earlier practice of paying in advance. In the past, the company's North American and European operations used different sets of suppliers. In the new approach, preference in both locations will be given to suppliers that are world leaders in quality, service and price (White and Stertz, 1992). Lamming (1990: 665-670) describes similar trends among European assemblers, including a systematic reduction in their supply bases to less than 1000 companies. These trends have resulted in longer

term relationships with fewer suppliers that can provide high quality parts within a just-in-time supply system.

² In the network literature, higher structural autonomy implies that actors' relationships are free of structural holes at their own end and rich in structural holes at the other end. Burt (1992: 18) defines a structural hole as "a relationship of nonredundancy between contacts." In our context, this is equivalent to the observation that assembler-supplier interaction is characterized by richness in structural holes at the supplier end and sparseness in structural holes at the assembler end of the relationship. Both oligopoly among assemblers and the lack of conflicting group affiliations among suppliers are likely to lead to such an outcome (Burt, 1982: 266-273). Such a distribution of structural holes provides assemblers with both information and control benefits in the assembler-supplier network (Burt, 1992: 45-49).

³ The case of a dominant organization acquiring an equity interest in its suppliers has ample historical precedent in North America. In describing the expansion of Sears, Roebuck, and Co., Chandler (1962: 228) writes, "when products could not be purchased at a suitable price, the company often bought an interest in the factory that made these goods. By 1906, Sears, Roebuck had a financial investment in at least nine factories, by 1908 more than twenty, and by 1918 over thirty. These not only made durable goods, like farm implements and sewing machines, but also turned out shaped wood, furniture, clothing and shoes. Shortages during World War I increased the need for control over sources in order to have an assured supply." Sears acquired minority stakes in several

factories firstly to ensure steady supplies and secondly to control quality. Similar efficiency-based explanations have been offered for equity ownership in Japanese suppliers by assemblers.

⁴ The tendency to avoid suppliers in which competitors hold equity positions may be moderated by the fact that other assemblers cannot afford to ignore technological advances that can be accessed solely by dealing with suppliers affiliated with other assemblers (Lamming, 1990: 672).

⁵ Cusumano and Takeishi (1991: 569-570) studied the supplier networks of several Japanese assemblers in North America, finding a heavy reliance on suppliers that had manufacturing facilities in North America (three quarters of the number of suppliers). Japanese suppliers located in Japan accounted for only one eighth of the suppliers to these assemblers. Another one eighth of the parts studied were internally sourced by the assemblers from their operations in Japan. North American suppliers and Japanese suppliers based in North America accounted for three eighths each of the total supplier network of Japanese assemblers in North America. However, the study does not report whether the tendency for assemblers to source from North American or Japanese-owned suppliers in North America varied with the assemblers' experience and early supply practices in North America.

⁶ Positive interdependence that is based on complementary differences has been termed symbiosis (Hawley, 1950: 209). By contrast with symbiosis, Hawley refers to positive interdependence that is based on supplementary similarities between organizations as commensalism. An example would be the common

membership of assembler firms in industry trade associations (Barnett and Carroll, 1987: 401-402).

⁷ Assumptions concerning power-dependence relationships within organizational communities differ strikingly. In some views of the Japanese auto industry, for instance, each assembler largely determines the fate of its set of suppliers (e.g., Turnbull, Oliver, and Wilkinson, 1992). This judgment is consistent with the resource dependence assumption concerning relations between pairs of organizations. A more reciprocal view of relationships between suppliers and assemblers in communities such as the Japanese automobile industry is that they constitute a dense network of mutually beneficial ties (Ouchi, 1980; Lincoln, 1990). In any view of where power lies within a community, though, substantial interaction among network members will be required for the network to function.

⁸ By contrast with tightly-coupled networks, networks comprising only scattered links between elements may be sensitive to external shocks, but the effect of these shocks are localized to subsystems so that the network as a whole is likely to be more adaptive. At the same time, though, loose coupling creates communication problems and is not appropriate for large-scale systems where timely responsiveness to crises is valued (Weick, 1976).

REFERENCES

- Abegglen, James C., and George Stalk. *Kaisha, the Japanese corporation*. New York: Basic Books, 1985.
- Aldrich, Howard E. *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall, 1979.
- Aldrich, Howard E., and David A. Whetten. "Organization-sets, action-sets, and networks: Making the most of simplicity." In Paul C. Nystrom and William H. Starbuck (eds.), *Handbook of Organizational Design*, 385-408. London: Oxford University Press, 1981.
- Aoki, Masahiko. (Ed.) *The economic analysis of the Japanese firm*. Amsterdam: North-Holland, 1984.
- Asanuma, Banri. "Manufacturer-supplier relationships in Japan and the concept of relationship-specific skill." *Journal of Japanese and International Economies*, 3, 1-30, 1989.
- Astley, W. Graham, and Charles J. Fombrun. "Collective strategy: The social ecology of organizational environments." *Academy of Management Review*, 8, 576-587, 1983.
- Astley, W. Graham, and Charles J. Fombrun. "Organizational communities: An ecological perspective." In Nancy Di Tomaso and Samuel B. Bacharach (eds.), *Research in the Sociology of Organizations*, Volume 5, 163-186. Greenwich, CT: JAI Press, Inc., 1987.
- Barnett, William P., and Glenn R. Carroll. "Competition and mutualism among early telephone companies." *Administrative Science Quarterly*, 32, 400-421, 1987.
- Bartlett, Christopher A., and Sumantra Ghoshal. "Tap your subsidiaries for global reach." *Harvard Business Review*, 4(6), 87-94, 1986.

- Blenkhorn, David L., and Peter M. Banting. "Should North American parts suppliers learn Japanese?." *Journal of Business and Industrial Marketing*, 7, 29-40, Winter 1992.
- Burt, Ronald S. *Structural-holes: The social structure of competition*. Cambridge, MA: Harvard University Press, 1992.
- Burt, Ronald S. *Toward a structural theory of action: Network models of social structure, perception and action*. New York: Academic Press, 1982.
- Caves, Richard E. *Multinational enterprise and economic analysis*. Cambridge: Cambridge University Press, 1982.
- Caves, Richard E., and Masu Uekasa. *Industrial organization in Japan*. Washington, DC: The Brookings Institution, 1976.
- Chandler, Alfred D., Jr. *Strategy and structure: Chapters in the history of the American enterprise*. Cambridge, MA: The M.I.T. Press, 1962.
- Clark, Kim B., and Takahiro Fujimoto. *Product development performance*. New York: Free Press, 1991.
- Cook, Karen S. "Exchange and power in networks of interorganizational relationships." *The Sociological Quarterly*, 18, 62-82, 1977.
- Cusumano, Michael A. *The Japanese automobile industry: Technology and management at Nissan and Toyota*. Cambridge: Harvard University Press, 1985.
- Cusumano, Michael A., and Akira Takeishi. "Supplier and management: A survey of Japanese, Japanese-transplant, and U.S. auto plants." *Strategic Management Journal*, 12, 563-588, 1991.
- Dodwell Marketing Consultants. *The structure of the Japanese auto parts industry* (4th ed.). Tokyo: Dodwell Marketing Consultants, 1990.
- Dollinger, Marc J. "The evolution of collective strategy in fragmented industries." *Academy of Management Review*, 15, 266-285, 1990.

- Dunning, John H. Japanese participation in British industry. London: Croom Helm, 1986.
- Economist. "America's car makers: General Alarm." *Economist*, 80-82, December 21, 1992-January 3, 1992.
- ELM International, Inc. The ELM guide to Japanese transplant suppliers (2nd ed.). Lansing, MI: ELM International, 1991.
- Emerson, Richard M. "Power-dependence relations." *American Sociological Review*, 27, 31-41, 1962.
- Evan, William M. "The organization-set: Toward a theory of interorganizational relations." In James B. Thompson (ed.), *Approaches to organizational design*, 174-191. Pittsburgh: University of Pittsburgh Press, 1966.
- Fichman, Mark, and Daniel A. Levinthal. "Honeymoons and the liability of adolescence: A new perspective on duration dependence in social and organizational relationships." *Academy of Management Journal*, 16, 442-468, 1991.
- Florida, Richard, and Martin Kenney. "Transplanted organizations: The transfer of Japanese industrial organization to the U.S." *American Sociological Review*, 56, 381-388, 1991.
- Fombrun, Charles J. "Crafting an institutionally informed ecology of organizations." In Glenn R. Carroll (ed.), *Ecological models of organizations*, 223-239. Cambridge: Ballinger, 1988.
- Freeman, John, Glenn R. Carroll, and Michael T. Hannan. "The liability of newness: Age dependence in organizational death rates." *American Sociology Review*, 48, 692-710, 1983.
- Galaskiewicz, Joseph. "Interorganizational relations." *Annual Review of Sociology*, 11, 281-304, 1985.
- Gelsanliter, David. *Jump start: Japan comes to the heartland*. New York: Farrar Strauss Giroux, 1990.

- Gerlach, Michael L. *Alliance capitalism: The social organization of Japanese business*. Berkeley, CA: University of California Press, 1992.
- Ghoshal, Sumantra and Christopher A. Bartlett. "The multinational corporation as an interorganizational network." *The Academy of Management Review*, 15, 603-625, 1990.
- Gold, Bela. "Changing perspectives on size, scale, and returns: An interpretive survey." *Journal of Economic Literature*, 19, 5-33, 1981.
- Granovetter, Mark. "Economic action and social structure: The problem of embeddedness." *American Journal of Sociology*, 91, 481-510, 1985.
- Hannan, Michael T., and John Freeman. *Organizational ecology*. Cambridge, MA: Harvard University Press, 1989.
- Hawley, Amos H. *Human ecology: A theory of community structure*. New York: Ronald Press, 1950.
- Heide, Jan B., and Anne S. Miner. "The shadow of the future: Effects of anticipated interaction and frequency of contact on buyer-seller cooperation." *Academy of Management Journal*, 35, 265-291, 1992.
- Heide, Jan B., and George John. "Alliances in industrial purchasing: The determinants of joint action in buyer-supplier relationships." *Journal of Marketing Research*, 27 (1), 24-36, February 1990.
- Helper, Susan. "How much has really changed between U.S. automakers and their suppliers?" *Sloan Management Review*, 32, 15-28, Summer 1991.
- Helper, Susan. *Supplier relations and innovation in the auto industry*. Unpublished Ph.D. Dissertation, Harvard University, 1987.
- Hofstede, G.H. *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage Publications, 1980.
- Jarillo, J. Carlos. "On strategic networks." *Strategic Management Journal*, 9, 31-41, 1988.

- Kogut, B. and H. Singh. "The effect of national culture on the choice of entry mode."
Journal of International Business Studies, Fall, 19(3), 411-432, 1988.
- Kogut, Bruce. "Country capabilities and the permeability of borders." Strategic
Management Journal, 12, 33-47, 1991.
- Lamming, Richard C. "Strategic options for automotive suppliers in the global market."
International Journal of Technology Management, 5(6), 649-684, 1990.
- Laumann, Edward O., Joseph Galaskiewicz, and Peter V. Marsden. "Community
structure as interorganizational linkages." Annual Review of Sociology, 4, 455-
484, 1978.
- Leik, Robert K. "New directions for network exchange theory: Strategic manipulation of
network linkages." Social Networks, 14, 309-323, 1992.
- Levinthal, Daniel A. and Mark Fichman. "Dynamics of interorganizational attachments:
Auditor-client relationships." Administrative Science Quarterly, 33, 345-369,
1988.
- Lincoln, James R. "Japanese organization and organization theory." In Larry L.
Cummings and Barry M. Staw (eds.), Research in Organizational Behavior,
Volume 12, 255-294. Greenwich, CT: JAI Press Inc., 1990.
- Lincoln, James R., and Kerry McBride. "Japanese industrial organization in comparative
perspective." Annual Review of Sociology, 13, 289-312, 1987.
- Lincoln, James R., Michael L. Gerlach, and Peggy Takahashi. "Keiretsu networks in
Japan: A Dyad analysis of intercorporate ties." American Sociological Review,
57, 561-585, 1992.
- Luke, Roice D., James W. Begun, and Dennis D. Pointer. "Quasi-firms: Strategic
interorganizational forms in the health care industry." Academy of Management
Review, 14 (1), 9-19, 1988.

- Lyons, Thomas F., A. Richard Krachenberg, and John W. Henke, Jr. "Mixed motive marriages: What's next for buyer-supplier relations?" *Sloan Management Review*, 31, 29-36, Spring 1990.
- Miner, Anne S., Terry L. Amburgey, and Timothy M. Stearns. "Interorganizational linkages and population dynamics: Buffering and transformational shields." *Administrative Science Quarterly*, 35, 689-713, 1990.
- Mitchell, Will, and Kulwant Singh. "Technological complexity and organizational choice in the medical information system industry, 1970-1990." University of Michigan working paper, 1992.
- Mitchell, Will, J. Myles Shaver, and Bernard Yeung. "Getting there in a global industry: Impacts on performance of changing international presence." *Strategic Management Journal*, 13, 419-432, 1992.
- Monteverde, Kirk, and David J. Teece. "Appropriable rents and quasi-vertical integration." *Journal of Law and Economics*, 25, 321-328. 1982.
- Nelson, Richard R. and Sidney G. Winter. *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press, 1982.
- Nohria, Nitin, and Robert G. Eccles (eds.). *Networks and organizations: Structure, form, and action*. Boston: Harvard Business School Press, 1992.
- Odaka, Konosuke, Keinosuke Ono, and Fumihiko Adachi. *The automobile industry in Japan: A study of ancillary firm development*. Tokyo: Kinokuniya Company, 1988.
- Oliver, Christine. "Determinants of interorganizational relationships: Integration and future directions." *Academy of Management Review*, 15, 241-265, 1990.
- Ouchi, William G. "Markets, bureaucracies, and clans." *Administrative Science Quarterly*, 25, 120-142, 1980.

- Pennings, Johannes M. "Strategically interdependent organizations." In Paul C. Nystrom and William H. Starbuck (eds.), *Handbook of Organizational Design, Volume 1*, 433-455. London: Oxford University Press, 1981.
- Pfeffer, Jeffrey, and Gerald R. Salancik. *The external control of organizations*. New York: Harper & Row, 1978.
- Powell, Walter W. "Neither market nor hierarchy: Network forms of organization." In Larry L. Cummings and Barry M. Staw (eds.), *Research in Organizational Behavior, Volume 12*. 295-336. Greenwich, CT: JAI Press Inc., 1990.
- Prahalad, C.K. and Yves L. Doz. *The multinational mission: Balancing local demands and global vision*. New York: Free Press, 1987.
- Simon, Herbert A. "The architecture of complexity." *Proceedings of the American Philosophical Society*, 106, 467-482, 1962.
- Stearns, Timothy M., Alan N. Hoffman, and Jan B. Heide. "Performance of commercial television stations as an outcome of interorganizational linkages and environmental conditions." *Academy of Management Journal*, 30, 71-90, 1987.
- Stertz, Bradley A. "Importing solutions: Detroit's new strategy to beat back Japanese is to copy their ideas." *The Wall Street Journal*, October 1, 1992.
- Stinchcombe, Arthur L. "Organizations and social structure." In James G. March (ed.), *Handbook of Organizations*, 142-193. Chicago: Rand-McNally, 1965.
- Teece, David J. "Technology transfer by multinational firms: The resource costs of transferring technological know how." *Economic Journal*, 87, 242-261, 1977.
- Teece, David J. "Towards an economic theory of the multiproduct firm." *Journal of Economic Behavior and Organization*, 3, 39-63, 1982.
- Thorelli, Hans B. "Networks: Between markets and hierarchies." *Strategic Management Journal*, 7, 36-51, 1986.
- Tichy, Noel M., Michael L. Tushman, and Charles J. Fombrun. "Social network analysis for organizations." *Academy of Management Review*, 4, 507-519, 1979.

- Turnbull, Peter, Nick Oliver, and Barry Wilkinson. "Buyer-supplier relations in the UK automotive industry: Strategic implications of the Japanese manufacturing model." *Strategic Management Journal*, 13, 159-168, 1992.
- Vernon, Raymond. *Sovereignty at bay*. New York: Basic Books, 1971.
- Weick, Karl E. "Educational organizations as loosely coupled systems." *Administrative Science Quarterly*, 21, 1-19, 1976.
- Weick, Karl E. *The social psychology of organizing* (2nd edition). Reading, MA: Addison-Wesley, 1979.
- Whetten, David A. "Interorganizational relations: A review of the field." *Journal of Higher Education*, 52, 1-28, 1981.
- White, Joseph B. "GM expects to post a 1991 loss of nearly \$6 billion: Details of auto maker's recovery plan are expected from Stempel." *The Wall Street Journal*, February 24, 1992.
- White, Joseph B., and Bradley A. Stertz. "GM launches drive to slash costs of parts: New purchasing Czar moves to upset norms, re-bid contracts for '93 models." *The Wall Street Journal*, June 3, 1992.
- Williamson Oliver E. *The economic institutions of capitalism: Firms, markets, relational contracting*. New York: Free Press, 1985.
- Williamson, Oliver E. "Comparative economic organization: The analysis of discrete structural alternatives." *Administrative Science Quarterly*, 36, 269-296, 1991.
- Williamson, Oliver E. "Technology and transaction costs economics: A reply". *Journal of Economic Behavior and Organization*", 10, 355-363, 1988.
- Williamson, Oliver E. *Markets and hierarchies: Analysis and antitrust implications*. New York: Free Press, 1975.
- Womack, James P., Daniel T. Jones, and Daniel Roos. *The machine that changed the world*. New York: Rawson Associates, 1990.

TABLE 1. SUMMARY OF PROPOSITIONS, BY PERSPECTIVE

PROP.	COVARIATE	EXPECTED EFFECT OF COVARIATE INCREASE
<u>Interorganizational Experience Perspective</u>		
1.	Duration of assembler-supplier relationship in home country	Positive on recreation
2.	Number of assemblers to which a supplier sells components in home country	Positive on recreation (alternative to proposition 4) Positive on extension by supplier
<u>Power-Dependence Perspective</u>		
3.	Assembler/supplier size ratio	Positive on recreation
4.	Number of assemblers to which a supplier sells components in home country	Negative on recreation (alternative to proposition 2)
5.	Assembler buys a specific component from only one supplier in home country	Positive on recreation
6.	No. of suppliers from which an assembler buys a specific component in home country	Nonmonotonic (inverted U) on recreation
7.	No. of assemblers to which a supplier is sole source for a specific component in home country	Negative on recreation
8.	Supplier equity or board membership held by assembler	Positive on recreation
9.	Supplier equity or board membership held by other assemblers	Negative on extension by supplier

TABLE 1 (CONTINUED)

PROP.	COVARIATE	EXPECTED EFFECT OF COVARIATE INCREASE
<u>Scale And Scope Perspective</u>		
10.	Proportion of assemblers operating in new location to which a supplier sells goods in new location	Positive on recreation Positive on extension by supplier
11.	Assembler's production in new location	Positive on recreation Positive on extension by assembler
12a.	Early entry to new location by assembler	Positive on recreation
12b.	Late entry to new location by assembler	Negative on extension by assembler
13.	Extent to which an assembly transplant buys from transplant suppliers when the assembler first expands	Positive on recreation Positive on extension by assembler Stronger effect over time
14.	Assembler's transplant growth rate relative to assembler's growth rate in home country	Positive on recreation
15.	Assembler performance	Positive on recreation Positive on extension by assembler
<u>Transaction Cost Perspective</u>		
16.	Location-based transaction specificity of assembler-supplier home-country relationship	Positive on recreation Negative on extension by supplier
<u>Organizational Community Perspective</u>		
17.	Number of links in supply community	Negative on recreation