Learning scope and knowledge creation
Network learning in the supplier-buyer
context

E-mail bmacth@ccunix.ccu.edu.tw

89 10 31

LEARNING SCOPE AND KNOWLEDGE CREATION: NETWORK LEARNING IN THE SUPPLIER-BUYER CONTEXT

1000

1000

ABSTRACT

At the beginning of a new millennium, diversity and spirituality are celebrated around the world. The theories and practices of management are no exception. This paper presents empirical findings from a model that emphasizes using an indigenous construct of identity to explore the issue of network learning in the supplier-buyer context. Along with identity, prospector strategy and organizational distance are the three independent variables adopted to explain the two dependent variables of learning scope and knowledge creation in this study. Learning scope refers to one-way knowledge transfer from the senior foreign corporate buyer to its junior Taiwanese supplier. On the other hand, knowledge creation applies to active learning where the Taiwanese firm jointly creates knowledge with its buyer. All three independent variables are hypothesized to be related to the two dependent variables. Results from a preliminary analysis of 36 survey responses from the computer and electronics industries in Taiwan show that only organizational distance is related to learning scope. However, all three independent variables are related to knowledge creation. It appears that to achieve the more active learning of knowledge creation, picking the right partner with matching organizational distance is not enough. An identity that strives for national pride and a prospector strategy that goes for innovation are also required. One surprising finding comes from the control variable of number of foreign subsidiaries. It is negatively related to knowledge creation. It seems that learning with one's own internal network of overseas subsidiaries can substitute for learning with one's key foreign corporate buyer. While this study may have uncovered some interesting findings, they are all very preliminary. The author is in the process of collecting more survey responses and other secondary data for a refined analysis in the near future. In conclusion, this paper advocates more research on Taiwanese firms to cross over the sea of differences between the West and

the developing parts of the world. It is hoped that this cross-over effort may bring understanding and harmony to the world in the new millennium.

LEARNING SCOPE AND KNOWLEDGE CREATION: NETWORK LEARNING IN THE SUPPLIER-BUYER CONTEXT

In recent years, Taiwan has made significant progress in the information technology sector. Numerous statistics show that it not only ranks number three in manufacturing information products in the world, but it also attains number one position in many individual information product categories (Chan, 2000). However, a closer look promptly reveals that Taiwan mostly carries out the production of items that its foreign buyers develop. While Taiwan traditionally has used volume to compensate for low profit margins, the outcome with this manufacturing only practice is bound to reach its limits with other countries using even lower wages to compete for the same buyers.

In addition to the above issue from practitioners' perspective, researchers recently have shown great interest in knowledge management (Simonin, 1999). One stream in knowledge management particularly emphasizes learning through network relationships (Kale, Singh & Perlmutter, 2000). The Taiwanese context not only gives researchers an excellent opportunity to answer questions of real-world implications, but also lends itself well to address the issue of learning from networking partners. The success of Silicon Valley has been attributed to its extensive network quality (Saxenian, 1990). Other non-U.S. examples such as Italy have also appeared widely in the literature (Lazerson, 1995). Even though Taiwan's economy shares many of the network

qualities, it has yet to received its fair share of coverage in the literature. The purpose of this paper is to report the empirical results of a study designed to fill in this gap. This paper will first review the network learning literature and then describes briefly the Taiwanese context before presenting its hypotheses. A methodology section will be followed with a discussion section that attempts to apply the results to firms in other non-Western countries. In so doing, it is hoped that a balanced view of how firms effectively carry out their network learning will emerge in the new millennium.

THEORY DEVELOPMENT
Network Learning

In sharp contrast to Porter's (1980) original framework of five driving forces of industry competition, recent strategy research has witnessed a trend moving away from competition to cooperation (Combs & Ketchen,1999). The beginning of this trend may be traced back to the early '80s when the Japanese firms were making significant inroads in the automobile and consumer electronics industries. To Western observers, the Japanese emphasis on building long-term relationships with key partners seemed to be the answer to why the Japanese were outperforming their Western rivals. Within two decades, the Japanese are facing their own problem of a low-growth economy. However, the interest in cooperation instead of competition has flourished into a blossom in network research.

As a recent special issue on strategic network by Strategic Management Journal (2000) shows, numerous studies of network have offered answers to why alliances and networks exist. For instance, Gulati (1999) provided solid evidences that previous networking experience facilitates more subsequent network building. On the other

hand, Gulati, Nohria and Zaheer (2000) urged researchers to search for answers to another equally important issue: 'Do alliances and networks really matter when it comes to firm performance?' Although performance-driven network studies may not be as abundant as Gulati et al. would like to see, the literature contains several studies that show the positive effect of network on organizations. Some examples include (1) social proximity to prior adopters of a radio broadcasting format increases its adoption by the focal firm (Greve, 1996), (2) chain affiliation improves the survival rates of component hotels in Manhattan under most circumstances (Ingram & Baum, 1997a), (3) network ties help members stay in a R&D consortium (Olk & Young, 1997), (4) R&D ties increases subsequent non-R&D ties and sales growth in the biotechnology industry (Powell, Koput & Smith-Doerr, 1996), (5) the likelihood of supplier expansion overseas increases as the number of its current buyers that have expanded overseas increases (Martin, Swaminathan & Mitchell, 1998), (6) effective interfirm collaboration minimizes transaction costs and maximize transaction value (Dyer, 1996, 1997), (7) network linkages enable small Taiwanese firms to engage in foreign direct investment (Chen & Chen, 1998), (8) interorganizational networks lead to reduced uncertainty and improved adaptation by liberal arts colleges (Kraatz, 1998), (9) interfirm relationship in the packaging machinery industry in Italy promotes company growth and innovation (Lorenzoni & Lipparini, 1999), and (10) interfirm networks in the apparel industry's better-dress sector contain both arm's length ties and embedded ties, and embedded ties possess the effect of close personal relationships, thick information sharing and joint problem solving (Uzzi, 1997).

Besides the common interest in studying network members cooperation,

network researchers come from various camps. For instance, Khanna, Gulati and Nohria (1998) have drawn heavily on economics to present their model of the dynamics of alliance learning. Two years later, Inkpen (2000) provided a critique to this model. In Inkpen's view, the model falls short of providing a detailed process view of how alliance learning takes place. Similarly, while many researchers have applied transaction cost theory to specify mechanisms to reduce costs of network learning, others have advocated a sociological approach to untangle the relationship building process of network learning. As Khanna et al. (2000) replied to Inkpen's (2000) critique, the debate offers an opportunity to combine both economics and sociology to shed light on network research.

Although the model tested in this study does not specifically segment its variables into economic and sociological groups, this model deliberately contains three contrasting independent variables to explain the scope of learning and knowledge creation with network partners. To maintain a manageable scope, this study focuses on one type of network partners, the supplier-buyer pair. Since most Taiwanese firms are junior partners of their foreign corporate buyers, this focus will highlight the learning need of the Taiwanese firms. As for the three independent variables, the first two relate to the firm's internal characteristics. While identity describes whether the firm views itself with pride about what it stands for, prospector strategy measures how innovative the firm is. The last independent variable of organizational distance captures the similarity in management philosophy and practices between the firm and its key buyer.

By including the internal variables of value and action, this paper follows the footprint of the resource-based theory

(Barney, 1991). More specifically, identity and strategy may flesh out the concept of absorptive capacity (Cohen & Levinthal, 1990) in further detail. Maintaining a long-term relationship with key buyers offers an opportunity for the firm to learn from the network relationship. However, many observers have pointed out that not every firm possesses an equal capacity to learn (Anand & Khanna, 2000). Searching for variables explaining this interfirm variance should be of great interest to both practitioners and researcher. Admittedly, this paper chooses a limited scope of network context, i.e., the firm and its key corporate buyer. To maintain a close match with this context, this paper selected the variable of organizational distance to operationalize the pairwise relationship between the firm and its buyer.

Supplier-Buyer

Network alliances come in a variety of forms, such as joint ventures, licensing agreements, distribution and supply agreements, research and development partnerships, and technical exchanges (Inkpen, 2000:778). This study focuses on the supplier-buyer alliance form to highlight the potential that the junior Taiwanese firms may learn from their foreign corporate buyers. The learning opportunity is most obvious in the marketing area. Realizing that being a manufacturer without owning one's own brand spells low profit margins, many Taiwanese firms have tried to establish their own brands without much success. In frustration, some of them have gone to the acquisition route to buy up foreign brands. In addition to brand management, learning opportunities also exist in other areas such as human resources management and product usability. For instance, the media has reported that one local firm learns to adopt the 360 degree performance

evaluation from its buyer, HP. Another blue-chip Taiwanese software firm is reported to have learn from Intel how to master the task of user-friendly test with great satisfaction. More complicated arrangement resulting from a close supplier-buyer relationship is also possible. When Compaq acquired Digital's PC business, Compaq's Taiwanese supplier acquired Digital's production facility in Taiwan to expand its manufacturing capacity for Compaq.

The above phenomenon of cooperation and learning in the supplier-buyer context has been the research focus in some recent studies. For instance, Dyer and Nobeoka (2000) provided a detailed account of how Toyota's production network encourage more network knowledge sharing than other competing automaker network. Specifically, Toyota's network motivates members to participate and openly share valuable knowledge, prevents free riders, and reduces the costs of searching and applying various types of knowledge. While Toyota may be an exceptional case of a close supplier-buyer relationship network, Kaufman, Wood and Theyel (2000) offered a strategic supplier typology to cover a wide spectrum of possible supplier-buyer arrangement. By devising a two-by-two figure with collaboration and technology as its two dimensions, Kaufman et al. presented four types of supplier. Starting from low to high working relationship with the buyer, these include commodity supplier, technology specialist, collaborative specialist and problem-solving supplier. Just as Dyer and Noboeka (2000) attributed Toyota's competitive edge to Toyota's supplier network, Kaufman et al. found that the firms in the problem-solving quadrant have the largest number of employees, have the highest percentage of export sales, pay the highest wages and have the highest relative

gross margins.

The above two recent studies documented the positive performance consequences of supplier-buyer alliances. As such, they echo the claims of the broader network literature that network provides an unique source of competitive advantage. One way to differentiate the supplier-buyer context from the general network framework may be to follow the distinction between scale alliances and link alliances (Dussauge, Garrette & Mitchell, 2000). Scale alliances refer to alliances where partners contribute similar knowledge, while link alliances apply to alliances where partners combine asymmetric knowledge. This contrast is similar to that of cost sharing alliances vs. skill sharing alliances (Sakakibara, 1997). Sakakibara found that the former tends to involve partners with homogeneous capabilities, while the latter with heterogeneous capabilities. Similarly, Dussauge, Garrette and Mitchell(2000) found that link alliances lead to greater level of learning. These two studies suggest that supplier-buyer alliances resemble skill sharing and link alliances. As such, the potential for alliance learning should be great. It is this potential that motivates this study's selection of the supplier-buyer context.

Nevertheless, there is a dark side to the supplier-buyer alliances. First is the unique status issue where the Taiwanese firms usually play the role of junior partners. Research in status (Chung, Singh & Lee, 2000) has shown that lower-status firms face more constraints in networking than higher-status firms. There may be room for learning from foreign buyers, but the lower-status Taiwanese firms are likely to be constrained to passive, one-way learning dictated by their senior foreign partners. Then there is the issue of being too close to one's buyers (Afuah, 2000). As Connor (1999) and Slater and Narver (1999) argued with each other, the issue of

maintaining a balance between current customer needs and future market trend can determine a firm's survival chance in the long term. By studying the Reduced Instructive Set Computer (RISC) technology community, Afuah (2000) confirmed that with the advance of RISC technology, firms sticking to customers and suppliers from the previous Complex Instructive Set Computer technology suffer significantly in performance. With this dark side of supplier-buyer alliance in mind, this study proceeds to empirically examine the learning taking place in the supplier-buyer context. The next section discusses two types of learning addressed in this study.

Learning Scope and Knowledge Creation

As Simonin (1999:596) pointed out, many network researchers have focused on the issues of alliance formation, determinants of cooperation, forms of collaborations, and alliance outcomes. Even studies that go one step further to examine network learning and knowledge transfer fall short of linking the nature and dimensionalities of knowledge to transferability. Simonion attributed this phenomenon as the classical outcome vs. process debate. Given that 'knowledge has emerged as the most strategically significant resource of the firm' (Grant 1996:375) and that knowledge potentially can explain the critical issue of resource inimitability stressed by the resource-based literature (Barney, 1991), this study attempts to examine the issue of learning scope and knowledge creation in the supplier-buyer context.

Simonin (1999) has provided a comprehensive account to describe the process of knowledge transfer in strategic alliances. His process-oriented model contains an abundance of knowledge-related constructs: tacitness,

specificity, complexity, experience, partner protectiveness, cultural distance, organizational distance, ambiguity, collaborative know-how, learning capacity, alliance duration and knowledge transfer. While Simonin depicted his model in a way to highlight the link between knowledge ambiguity and knowledge transfer, this study selects its three independent variables to explain learning scope (knowledge transfer) and knowledge creation. The main focus is to explain the variance of learning scope and knowledge creation as much as possible. As compared to the one-way learning nature of learning scope, knowledge creation goes one step further to examine how the focal Taiwanese firm can take on a more active role and create knowledge jointly with its key buyer. By studying the issue of knowledge creation, this study aims to update the view that corporations from non-Western countries are students of their Western counterparts. The literature of the MNCs subsidiaries network has shown that foreign subsidiaries are capable of being knowledge creator (Gupta & Govindarajan, 2000; O'Donnell, 2000). Similarly, there is no reason to preclude the possibility that for a namebrand U.S. buyer, its foreign supplier can actively create knowledge for it. Although this possibility may bring in the thorny issues of knowledge protection and potential future competitors, utilizing this active learning may provide key competitive resources for the U.S. firm, not just for the knowledge-creating supplier.

Identity

Regardless of two-way knowledge creation or one-way knowledge transfer, network learning can benefit from a discussion that goes beyond learning routines and uncovers the organizational mentality beneath them. For instance, researchers (Sitkin, Sutcliffe & Schroeder,

1994:546) have pointed out that TQM philosophy can range from a control mentality to a more open learning attitude. While a control mentality puts its emphasis in cost reduction and variance minimization, a learning attitude strives for opening up new possibility in areas other than cost reduction. Without addressing the issue of mentality, researchers are less likely to discern the various types of TQM adoption and trace the causes of their resulting differences in performance. There are many areas other than TQM that can be the subject of network learning, and each is a candidate for incorporating mentality to expand researchers' explanatory power.

The extant identity literature provides a foundation for this study to incorporate the role played by mentality in network learning. Identity refers to the very basic value system underlying what an organization prefers to do nor not to do (Albert & Whetten, 1985). Researchers have discussed the benefits of a shared identity (Naphapiet & Ghoshal, 1998:256), but its conceptualization varies according to the context at hand. This is similar to the problem facing research in organizational culture (Hofstede, 1991). There is no single set of items that can describe organizational identity or culture for every organization. For instance, Kogut and Zander (1996) argued that a shared identity can lower costs of communication and facilitate coordination at the firm level. Similarly, Dyer and Nobeoka (2000) echoed that a shared identity can lower the cost of knowledge sharing at the network level. However, the issue of how to measure the shared identity is left unresolved.

Several studies in the West have relied on the distinction between utilitarian identity and normative identity (Albert & Whetten, 1985). This study borrows the same dichotomous ideas of two contrasting identities but creates new content for them.

While an utilitarian identity goes for profit maximization, a normative identity strives for broader contribution to the society (Gioia & Thomas, 1996). Although the contrast between profit maximization and societal welfare is general enough to apply to both Western and non-Western context, one of the main research motivations of this study is to flesh out the unique characteristics of the Taiwanese firms. As widely reported in the local press and confirmed by the author's informal field interviews, a group of Taiwanese firms are very proud of their nationality. Particularly for those firms trying to establish their own namebrand in the world market, their effort is proclaimed not just in their own self interest but also for the benefit of the whole island's product quality image in the world. As a result, this study pinpoints those areas that reflect this spirit of national pride in what the firm does, not just what the firm earns financially.

While the phenomenal success of the Silicon Valley is widely admired, few observers have given credit to Taiwanese firms' contribution to Silicon Valley's success. Without Taiwanese firms' manufacturing prowess, the creative ideas of Silicon Valley will not make it to the market in time. This close supplier-buyer relationship widely adopted in the Silicon Valley-Taiwan community provides an excellent opportunity for the junior Taiwanese firms to learn from their senior foreign corporate buyers. Furthermore, a selected group of Taiwanese firms may even take on a more active role of creating knowledge jointly with their buyers. Both types of learning reflect not just the need for better performance but also the underlying psychological drive to achieve an equal status on the world's stage. Therefore, this study presents the following pair of hypotheses.

H1a: Identity and learning scope are positively related.

H1b: Identity and knowledge creation are positively related.

Prospector Strategy

While identity highlights the underlying motivation of learning from and with buyers, prospector strategy reflects whether the focal Taiwanese firm has a matching strategy to facilitate the learning. Relying on Miles and Snow's (1978) seminal study of business strategy, various researchers have studied the issue of organizational adaptation. For instance, Meyer (1982) studied the effect of a doctors' strike on hospitals locating in the Bay area. However, the responses to the environmental jolt by these geographically proximate hospitals vary. Specifically, while Meyer found that defender, prospector and analyzer all are strategies capable of dealing with the jolt, only prospector emphasizes experiment and learning as its adaptation tactics. Zajac and Shortell (1989) subsequently examined the health care industry as well. They found that when facing a major environmental shift (the Medicare Prospective Payment System), hospitals would change their strategy away from defender towards analyzer and prospector. Furthermore, defender performed poorly, as compared with analyzer and prospector. Less concerned with the performance implications of the various strategies, Fox-Wofgramm, Boal and Hunt (1998) focused on the process of the adaptation. While they found defender ended up with an aborted adaptation, prospector was able to proceed towards a reorientation. In sum, while the thesis of equal viability of the various strategies has been contested in the literature, researchers seem to have agreed that prospector sets itself apart by excelling in experimenting and learning.

Another way to discuss the relationship between strategy and learning is

through the paradox of core rigidity (Leonard-Barton, 1992). While the basic assumption of this paper is that Taiwanese firms can learn from their network partners, the learning literature has identified risks from emphasizing too much on short term and local learning. For instance, Ingram and Baum (1997b) found that organizations initially benefit from their own operating experience, but it eventually comes to hurt the organizations in the complete hotel chain industry in the U.S. from 1896 to 1985. According to Ingram and Baum (p.94), "We attribute the eventual harm from own operating experience to the inertia that develops from exploiting a given set of routines, ultimately leading the organization into a competency trap." As compared with prospector, defender has a more limited scope of operations to pursue efficiency. Yet, overall effectiveness may suffer should environmental changes make defender's efficient routines obsolete. In other words, a changing environment can transform defender's core competence into core rigidity. On the other hand, prospector tends to embark on long term and global learning, reducing the danger of competency trap. As a result, prospector is more likely than defender to experiment and learn, with or without network partners. This study therefore presents its strategy hypotheses as below.

H2a: A prospector strategy is positively related to learning scope.
H2b: A prospector strategy is positively related to knowledge creation.

Organizational Distance

While identity and prospector strategy relate to the internal characteristics of the focal Taiwanese firm, organizational distance measures the similarity in operations, management style and culture between the Taiwanese firm and its key corporate buyer

(Simonin, 1999). Other researchers have examined the same construct but labeled it as similarity. For instance, Saxton (1997) proposed that similarities between partners will be positively related to alliance outcomes. Likewise, Johnson, Cullen, Sakano and Takenouchi (1996) confirmed that greater similarity between local firm and its partners results in higher levels of partner trust of the local firm. Regardless of what label one uses, intensive communication and coordination are prerequisites for learning to take place between two partners. Organizational distance is likely to make effective communication and coordination difficult. Furthermore, the interaction between the two partners is likely to encounter an extra obstacle of cross-cultural communication. Amplified by this cultural distance (Hofstede, 1991), organizational distance will impede effective communication and coordination to take place between the partners.

Not only partners must invest extra time and effort to understand each other, they also face the thorny issue of trust (Rousseau, Sitkin, Burt & Camerer,1998). Without a certain degree of familiarity, partners are not likely to put a lot of trust in each other in the beginning (Johnson et al., 1996). Furthermore, misunderstanding amplified by organizational distance is likely to reduce whatever trust that is there. Lacking this social lubricant of trust (Nooteboom & Noorderhaven, 1997), the two partners will be occupied by the urgent task of devising safeguard mechanisms to reduce transaction cost (Gulati & Singh, 1999). As a result, learning from and with each other will become a remote possibility and luxury relegated to a distant future after the partners work out their differences.

While the literature is filled with studies documented the detrimental effect of organizational distance, it should be noted that a certain degree of diversity

nevertheless can promote learning. On the one hand, learning requires some mutual common ground on which the partners can build new knowledge. On the other hand, learning also demands that partners combine their own unique skills and resources to create new knowledge (Johnson et al., 1996). The concept of complementary resources captures this phenomenon. For instance, by studying U.S. investment banking firms' syndication in underwriting corporate stock offering during the 1980s, Chung, Singh and Lee (2000) found that investment banks' alliance formation is positively related to the complementarity of their capabilities. The solution to this dilemma may be to differentiate the core from the peripheral. The mutual common ground may act as the core, and the diversity in skills and resources may serve as the peripheral. However, to maintain a manageable scope, this study focuses on organizational distance as similarity in the core only. Therefore, this study presents the last set of hypotheses as below.

H3a: Organizational distance is positively related to learning scope.

H3b: Organizational distance is positively related to knowledge creation.

METHODOLOGY

Copies of the revised questionnaire were mailed to 132 firms in the computer industry and 221 firms in the electronics industries in Taiwan in early May, about one year after the previous phrase of the research project. The list of the firms comes from the Commonwealth 1000 firms in Taiwan. This study selected all those firms from the two industries on the list. After two rounds of mailing, the author collected 36 completed responses in early July. Surprisingly, the firms in the computer industry returned only 6 responses, dragging down the overall response rate to only 10%. Although it can be argued that these two industries are very similar to each other, this study is in the process of collecting more responses from the computer industry. Therefore, the results reported in this paper are still very preliminary.

Dependent Variable

This study revised the work of Simonin (1999:623) to ask respondents to evaluate the scope of their learning from their key corporate buyers. *Learning scope* contains six items such as R&D, production and etc. Its alpha is .93. This study designed an original three-item scale to capture the more active learning of creating knowledge with and for the buyer. *Knowledge creation* contains three items, including creating new professional knowledge with the key buyer, providing professional knowledge to help the buyer upgrade its competitiveness, and providing professional knowledge to assist the buyer to innovate continuously. Its alpha is .79. Respondents were asked to rate each item in the above two dependent variables on a seven-point Likert scale.

Independent Variables

In regard to *identity*, this study measured this variable with five original items.

These include: our corporation works hard to provide high-quality products to improve the image of Taiwanese products, our corporation hopes to achieve mutual learning with foreign buyers, and etc. Its alpha is .88. The respondents were asked to rate each item on a seven-point Likert scale.

This study followed the commonly-used scenario approach to measure *prospector strategy* (Zajac &

Shortell, 1989). The author wrote four paragraphs, each representing a defender, an analyzer, a prospector and a reactor, respectively. This study then lined up these types on a seven-point Likert scale, with defender having a value of one (low change), analyzer four (medium change), and prospector seven (high change). Reactor was labeled as a separate point outside the scale. The higher the score, the closer the firm's adaptation strategy resembles a prospector strategy.

As for *organizational distance*, this study borrowed the work of Simonin (1999) to rate each of the two items on a seven-point Likert scale. These two items include: the business practices and operational mechanisms of your key buyer are very similar to yours, and the corporate culture and management style of your key buyer is very similar to yours. Its alpha is .81. It should be noted that because of the wording of the items, a high score of organizational distance means the two partners are similar to each other.

Statistical Model

This study applied ordinary least square regression to test the three sets of hypotheses. In addition to testing the individual hypotheses, this study was also interested in examining the explanatory power of the independent variables as a group over that of the control variables. Any significant incremental contribution of F-value would support the claim that the independent variables jointly depict a solid model of learning scope and knowledge creation.

Controls

This study included four control variables to avoid their possible confounding effect on the dependent variables. *Firm's*

years in operation captures the experience effect that older firms may be more skillful in learning . *Number of overseas subsidiaries* corresponds to the firm's size in general as well as the extensiveness of its overseas operations. Similarly, *ratio of export over total sales* may capture the firm's size in general as well as its export orientation vs. foreign direct investment. Compared with relying on one's own subsidiaries network, an export-oriented firm may need to rely heavily on its partners to acquire new knowledge. As for *ratio of R&D over total sales*, higher investment in R&D is likely to give the firm a solid foundation for learning to take place. It also signals the firm's need for a high level of learning to keep it in the business.

Nonresponse Bias

This study is still in the process of collecting more responses and will therefore prepare a nonresponse bias report in the near future.

Validity Check

Although at this stage this study does not have data other than survey to carry out triangulation, a few correlation between its key variables and other variables contained in the survey may serve as a clue to the key variables' predictive validity. For instance, learning scope is positively related to knowledge transfer ($p<.001$), and knowledge creation to close buyer relationship ($p<.001$). The three independent variables also show some reasonable correlation with other variables. Identity is positively related to close buyer relationship ($p<.01$), citizenship behavior ($p<.01$), and leading technology ($p<.05$). Prospector strategy is positively related to previous year's prospector strategy ($p<.001$). Lastly, organizational distance is related to knowledge transfer ($p<.01$).

RESULTS

Table 1 shows the basic statistics of the key variables in this study. While there is no significant correlation between the independent variables, learning scope is positively related to organizational distance (H3a), and knowledge creation to identity (H1b), organizational distance (H3b), and learning scope.

Table 2 shows the results of two sets of hierarchical regression models to test the hypotheses formally. The first two columns address the dependent variable of learning scope. The first model contained only the four control variables. While the constant is significant, none of the four control variables is significant. The second model added the three independent variables following the four control variables. F-equation improves from .546 to 4.958 (F-change significant at p<.001) and adjusted R-square improves form -.055 to .489. Results of variance inflation factor are in the range of one to two, suggesting no threat of multicollinearity. However, of the three independent variables only organizational distance is related to learning scope (beta=.713, p<.001). Therefore, the first set of analyses give support to only H3a.

The third and fourth columns in Table 2 deal with the dependent variable of knowledge creation. The third model contained only the four control variables. The constant is positively related to knowledge creation (p<.001), and number of foreign subsidiaries is negatively related to knowledge creation (p<.05). The fourth model added the three independent variables on top of the four control variables. F-equation improves from 1.155 to 6.130 (F-change significant at p<.001) and adjusted R-square improves from .130 to .661. Results of variance inflation factor also are all in the range of one to two,

once again suggesting no threat of multicollinearity. While the control variable of number of foreign subsidiaries remains negatively related to knowledge creation (beta=-.110, p<.01), all three independent variables are positively related to knowledge creation. Specifically, identity has the largest coefficient at .532 (p<.01), organizational distance the second largest at .273 (p<.01), and prospector strategy the smallest at .120 (p<.05). Therefore, H1b, H2b and H3b receive support from model four.

DISCUSSION AND CONCLUSION

The recent boom in the network literature has provided many concrete evidences of the benefits provided by networking with partners. It is this potential of learning from and with network partners that motivates this study. Although this study is still a work in process, its preliminary findings offer several insights for further discussion. First is the issue of the two types of learning. The typical Taiwanese firm is usually described as the junior partner of its foreign corporate buyers. It is often assumed that the flow of knowledge is from the senior buyer to the junior Taiwanese firm. This one-way knowledge transfer has organizational distance as the only independent variable that can explain its variance in this study. Therefore, for a Taiwanese firm to master this particular type of one-way learning, choosing a buyer whose management practices and philosophy are similar to its own appears to be the key. However, once the learning is to become interactive and two-way, the firm will have to consider two more factors other than organizational distance. It needs to have an identity that strives for national pride and equal status with its partners. This passion may run against the image of a rational firm (Morgan,

1986), but identity is the most influential independent variable explaining the variance of knowledge creation. Then, it also needs to have a prospector strategy to facilitate the active learning. The spirit of innovation and experimentation is shared by both prospector strategy and active learning. In sum, learning scope requires careful selection of partners who are similar to oneself, while knowledge creation demands that the firm works on its own identity and strategy as well.

One surprising finding comes from the consistent negative correlation between number of foreign subsidiaries and knowledge creation. Originally, this study incorporated number of foreign subsidiaries as a control variable mainly to take out the effect of size. However, it not only turned out to be negatively related to knowledge creation in both the reduced and the full models, it also has a coefficient of -.110 in the full model. Its negative impact can almost wash out the positive effect of prospector strategy, whose coefficient is at .120. It appears that having a large number of foreign subsidiaries may provide an internal corporate network for cross-border learning to replace the opportunity of learning with foreign buyers.

This paper reports some preliminary results based on a sample of Taiwanese firms. As a newly developed country, Taiwan may serve as an ideal bridge to cross over the sea of differences between the West and the developing parts of the world. It is hoped that this cross-over effort may bring understanding and harmony to the world in the new millennium.

REFERENCES

Afuah, A. 2000. How much do your co-opetitors' capabilities matter in the face of technological change? *Strategic Management Journal*, 21: 387-404.

Albert, S. & Whetten, D.A. 1985. Organizational identity. In L.L. Cummings and B.M. Staw (eds.), *Research in Organizational Behavior*, 7: 263-295. Greenwich, CT:JAI Press.

Anand, B.N. & Khanna, T. 2000. Do firms learn to create value? The case of alliances. *Strategic Management Journal*, 21: 295-315.

Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.

Chan, W.N. 2000. A review and forecast of the information industry. *Electronics Industry Yearbook 2000*: 36-39.

Chen, H. & Chen. T. 1998. Network linkages and location choice in foreign direct investment. *Journal of International Business Studies*, 29: 445-468.

Chung, S., Singh, H. & Lee, K. 2000. Complementarity, status similarity and social capital as drivers of alliance formation. *Strategic Management Journal*, 21: 1-22.

Cohen, W. & Levinthal, D. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128-152.

Connor, T. 1999. Customer-led and market-oriented: A matter of balance. *Administrative Science Quarterly*, 20: 1157-1163.

Cumbs, J.G. & Ketchen, D.J. 1999. Explaining interfirm cooperation and performance: Toward a reconciliation of predictions from the resource-based view and organizational economics. *Strategic*

Management Journal, 20: 867-888.

Dyer, J.H. 1996. Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry. *Strategic Management Journal,* 17: 271-291.

Dyer, J.H. 1997. Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value. Strategic Management Journal, 18: 535-556.

Dyer, J.H. & Nobeoka, K. 2000. Creating and managing a high-performance knowledge-sharing network: The Toyota case. *Strategic Management Journal*, 21: 345-367.

Dussauge, P. Garrette, B. & Mitchell, W. 2000. Learning from competing partners: Outcome and durations of scale and link alliances in Europe, North America and Asia. *Strategic Management Journal*, 21: 99-126.

Fox-Wolfgramm, S.J., Boal, K.B. & Hunt, J.G. 1998. Organizational adaptation to institutional change: A comparative study of first-order change in prospector and defender banks. *Administrative Science Quarterly*, 43: 87-126.

Gioia, D.A. & Thomas, J.B. 1996. Identity, image, and issue interpretation: Sensemaking during strategic change in academia. *Administrative Science Quarterly*, 41: 370-403.

Grant, R.M. 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17: 109-122.

Greve, H. 1996. Patterns of competition: The diffusions of a market position in radio broadcasting. *Administrative Science Quarterly*, 41: 29-60.

Gulati, R. 1999. Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal*, 20: 397-420.

Gulati, R. & Singh, H. 1999. The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Administrative Science Quarterly*, 43: 781-814.

Gulati, R., Nohria, N. & Zaheer, A. 2000. Guest editors' introduction to special issue: Strategic networks. *Strategic Management Journal,* 21: 199-201.

Gupta, A.K. & Govindarajan, V. 2000. Knowledge flows within multinational corporations. *Strategic Management Journal*, 21: 473-496.

Hofstede, G. 1991. *Cultures and Organizations: Software of the Mind*. London, U.K.: McGraw-Hill.

Ingram, P. & Baum, J. 1997a. Chain affiliation and the failure of Manhattan hotels, 1898-1980. *Administrative Science Quarterly*, 42: 68-102.

Ingram, P. & Baum, J. 1997b. Opportunity and constraint: Organizations' learning from the operating and competitive experience of industries. *Strategic Management Journal*, 18: 75-98.

Inkpen, A.C. 2000. A note on the dynamics of learning alliances: Competition, cooperation, and relative scope. *Strategic Management Journal*, 21: 775-779.

Johnson, J.L., Cullen, J.B., Sakano, T. & Takenouchi, H. 1996. Setting the stage for trust and strategic integration in Japanese U.S. cooperative alliances. *Journal of International Business Studies*, 27: 981-1004.

Kale, P., singh, H. & Perlmutter, H. 2000. Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic Management Journal*, 21: 217-237.

Kaufman, A., Wood, C.H. & Theyel, G. 2000. Collaboration and technology linkages: A strategic supplier typology. *Strategic Management Journal,* 21: 649-663.

Khanna, T., Gulati, R., & Nohria, N. 1998. The dynamics of learning alliances: Competition, cooperation and relative scope. *Strategic Management Journal*, 19: 193-210.

Khanna, T., Gulati, R. & Nohria, N. 2000. The economic modeling of strategy process: 'clean models' and 'dirty hands.' *Strategic Management Journal*, 21: 781-790.

Kogut, B. & Zander, U. 1996. What firms do? Coordination, identity, and learning. Organization Science, 7: 502-518.

Kraatz, M.S. 1998. Learning by association? Interorganizational networks and adaptation to environmental change. *Academy of Management Journal*, 41: 621-643.

Lazerson, M. 1995. A new phoenix? Modern putting-out in the Modena knitwear industry. *Administrative Science Quarterly*, 40:34-59.

Leonard-Barton, D. 1992. Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13: 111-125.

Lorenzoni, G. & Lipparini, A. 1999. The leveraging of interfirm relationships as a distinctive organizational capability: A longitudinal study. *Strategic Management Journal*, 20: 297-316.

Martin, X., Swaminathan, S. & Michell, M. 1998. Organizational evolution in the interorganizational environment: Incentives and constraints on international expansion strategy. *Administrative Science Quarterly*, 43: 566-601.

Meyer, A.D. 1982. Adapting to environmental jolts. *Administrative Science Quarterly*, 27: 515-537.

Miles, R.E. & Snow, C.C. 1978. *Organizational Strategy, Structure and Process*. New York: McGrow-Hill.

Morgan, G. 1986. *Images of Organization*. Beverly Hills: Sage.

Nahapiet, J. & Ghoshal, S. 1998. Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23: 242-266.

Nooteboom, B. & Noorderhaven, N.G. 1997. Effects of trust and governance on relational risk. *Academy of Management Journal*, 40: 308-338.

O'Donnell, S.W. 2000. Managing foreign subsidiaries: Agents of headquarters, or an interdependent network? *Strategic Management Journal*, 21: 525-548.

Olk, P. & Young, C. 1997. Why members stay in or leave a R&D consortium:

Performance and conditions of membership as determinants of continuity. *Strategic Management Journal*, 18: 855-877.

Porter, M. 1980. *Competitive Strategy: Technique for Analyzing Industries and Competitors*. New York: The Free Press.

Powell, W.W., Koput, K.W. & Smith-Doer, L.S. 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41: 116-145.

Rousseau, D.M., Sitkin, S.B., Burt, R.S. & Camerer, C. 1998. Not so different after all: A cross-discipline view of trust. *Academy of Management Review:* 23: 393-404.

Sakakibara, M. 1997. Heterogeneity of firm capabilities and cooperative research and development: An empirical examination of motives. *Strategic Management Journal*, 18: 143-164.

Saxenian, A. 1990. Regional networks and the resurgence of Silicon Valley. *California Management Review*, Fall: 89-113.

Saxton, T. 1997. The effects of partner and relationship characteristics on alliance outcomes. *Academy of Management Journal*, 40: 443-461.

Simonin, B.L. 1999. Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20: 595-623.

Sitkin, S., Sutcliffe, K.M. & Schroeder, R.G. 1994. Distinguishing control from learning in total quality management: A contingency perspective. *Academy of Management Review*, 19: 537-564.

Slater, S.F. & Narver, J.C. 1999. Market-oriented is more than being

customer-led. *Strategic Management Journal*, 20: 1165-1168.

Uzzi, B. 1997. Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42: 35-67.

Zajac, E.J. & Shortell, S.M. 1989. Changing generic strategies: Likelihood, direction, and performance implications. *Strategic Management Journal*, 10: 413-430.

Table 1 Basic Statistics for Key Variables

Variable	Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9
1.V62	19.53	12.35	2.00	47.00									
2.V63	2.79	3.61	0.00	20.00	-.06 (.71)								
3.V64	49.08	29.64	0.00	100.00	-.34 (.04)*	.24 (.14)							
4.V54	9.65	11.94	0.30	50.00	.10 (.58)	.17 (.33)	.31+ (.06)						
5.IDENTY	6.27	0.69	4.00	7.00	.15 (.37)	-.04 (.82)	-.12 (.46)	.20 (.23)					
6.V43	5.09	1.93	0.00	7.00	.00 (1.00)	.24 (.17)	.02 (.89)	-.13 (.48)	.10 (.58)				
7.ORDIST	4.32	1.36	1.50	6.50	.34 (.04)*	.04 (.81)	-.06 (.71)	.14 (.41)	.15 (.35)	.08 (.63)			
8.LEARSC	4.41	1.39	1.17	7.00	.18 (.29)	.09 (.60)	.04 (.84)	.20 (.25)	.26 (.11)	.02 (.90)	.70*** (.00)		
9.KNOWCR	5.31	0.89	3.33	7.00	.06 (.73)	-.31+ (.07)	-.01 (0.94)	.12 (.48)	.55*** (.00)	.25 (.15)	.35* (.03)	.33* (.05)	

+ $P<.1$

* $P<.05$ V62   firm's years in operation   V54   R&D/sales %   ORDIST   organizational distance

** $P<.01$ V63   number of overseas subsidiaries   IDENTY   identity   LEARSC   learning scope

*** $P<.001$ V64   export /overall sales %   V43   prospector strategy   KNOWCR   knowledge creation

Table 2 Regressions of

Learning Scope and Knowledge Creation

	Dependent variable: Learning Scope		Dependent Variable: Knowledge Creation	
	Controls only	Controls Plus Xs	Controls only	Controls Plus Xs
Constant	3.715*** (.690)	-1.104 (2.050)	5.529*** .407	.540 (1.176)
V62	.017 (.020)	-.006 (.017)	-.003 .012	-.012 (.010)
V63	.023 (.066)	.029 (.052)	-.080* .039	-.110** (.030)
V64	.002 (.009)	.001 (.008)	.000 .005	.007 (.005)
V54	.019 (.021)	-.001 (.017)	.011 .013	-.002 (.010)
IDENTY		.426 (.328)		.532*** (.188)
V43		-.030 (.101)		.120* (.058)
ORDIST		.713*** (.143)		.273** (.082)
F-Equation	.546	4.958	1.155	6.130
F-Change		8.742***		9.506***
R^2	.066	.612	.130	.661

Adjusted R²	-.055	.489	.017	.553
N	36	30	36	30