

# The Role of Local Firm's Learning on Technology Transfer and Human Resources Development:

A study of international alliances between Thai and Japanese firms in the supporting industry

## 技術移転と人的資源開発に関する現地企業学習の役割

—タイのサポーター産業におけるタイと日本の国際提携企業の研究—

Patomviriyavong, Sathima

(パトムウィリヤウォング・サーティマー)

School of Business Administration,  
Department of International Business and Management  
Kanagawa University

### Contents

#### Chapter 1 Introduction

- 1.1 Statements of problem
- 1.2 Objectives of the study
- 1.3 Methodology of the study
- 1.4 Scope of the study

#### Chapter 2 Theoretical and Conceptual Framework

- 2.1 Theoretical Background
- 2.2 Conceptual Framework and Research Model

#### Chapter 3 Data Analysis and Conclusion

- 3.1 Hypotheses Testing
- 3.2 Conclusion

### References

Key Words: Organizational Learning, Strategic Alliances, Local Firm's Learning, Technology Transfer, Human Resource Development, Supporting Industry, Partner Attributes, Relationship Attributes, Knowledge Attributes

## CHAPTER 1

### Introduction

After the Plaza Accord in the mid-1980s, Japanese firms adopted a new approach to business by relocating their manufacturing facilities to lower-cost locations in order to maintain their international competitiveness. Thailand has been one of the preferred investment locations. The reason for this has been that Japanese firms have felt more resource-constrained in Thailand due to an increasingly competitive world economy. The importance of Japanese direct investment in Thailand has risen dramatically.

Obviously, the patterns of Japanese direct investments have changed from period to period and the number of Thai and Japanese international alliances has increased dramatically. The bulk of Japanese investment in Thailand's manufacturing industries is through collaboration with local Thai investors. It is also interesting to learn what experiences the international alliance associates have gained from their cooperation.

#### 1.1 Statements of problems

In the last decade in the arena of Thai and Japanese international alliances, there has been a proliferation of strategic alliances between two or more potentially competitive firms. Local partners in Thailand are treated as passive partners.

Researchers on international alliances have suggested that a mutual gain between partners is the essence of successful strategic alliances. However, most studies have focused mainly on the interests of foreign multinational corporations (MNCs). Local partners, in particular, those firms of the local partners in developing countries, are treated as passive partners. The strategic attributes affecting the outcome of the participation in the alliances have received no attention from researchers. By neglecting the perspective of local Thai partners, the understanding of the essence of strategic alliances is limited and thus far, there have been no widely accepted theories on the formulation of

international alliance and its possible consequences.

This study intends to fill some gaps in the area of strategic alliances in the literature of international alliances between Thai and Japanese firms by examining the perspectives of the Thai local partners and the Japanese partners. A broader way to treat international alliance is to define it as any form of collaboration between two firms that includes substantial contributions by partners of either technology transfer or human resources development.

#### 1.2 Objectives of the study

The study focuses on the criteria that multinational corporations have depended on the resources of strategic alliance partners overseas to commercialize their management, technology and manpower. The major objectives of this study were to clarify the nature of the relationship between the firm's learning technology transfer and human resource's development through international alliances between Thailand and Japan in the Thai supporting industry. The main objectives of this study are as follows.

1. To analyze the attributes of partner firms, partner's relationships, the knowledge gaining by local firm's learning and the impact of this on technology transfer and human resources development in Thailand.
2. To discover how Thai and Japanese international alliances shared mutual learning through firm's learning in order to explain the development of technology transfer and human resources development in Thailand.

#### 1.3 Methodology of the Study

The two-wave procedure in collecting the data from the international alliances between Thai and Japanese in the supporting industry was conducted. These were listed in the directory of the Board of Investment (BOI) Promoted Companies 1999.

The first wave was to interview an interview survey, at this stage; thirteen top managers and twenty local Thai workers were interviewed. The second wave consisted of sending the questionnaires to the top

management of 100 international alliance firms. The cover letter explained the objectives of the study and asked both the Thai and Japanese top management and the local Thai worker to complete the questionnaire.

For data analysis, multiple regression analyses provide a useful way for analyzing the data when there are several dependent variables that have inter-correlation. The relationships with each of the hypotheses were examined with the linear structural relationship equation model (LISREL model).

## 1.4 Scope of study

This study concentrated on two sub-sectors in the supporting industry in Thailand (electrical, electronics parts and automotive parts industries). Generally "supporting industry" is defined as an industry that supplies the parts and processing materials. The replacement equipment and parts (after sales) are a part of "supporting industry".

The main reason to select local supporting industry firms as local firms in Thailand for the case study is that supporting industry is promoted by the Board of Investment (BOI), a mechanism for local firms to develop their technological competitiveness and human resources competitiveness. In this study, the electrical, electronics parts and automotive parts industries are selected to examine as supporting industry because of their importance to the Thai economy in terms of technology transfer and human resources development.

According to the scope of strategic alliances perspectives, this study will cover a qualitative analysis as follows:

1. This study focuses only on the relationship in international alliances between Thai and Japanese firms in Thailand.
2. In this study "learning" refers to the local firm's learning from the alliances.

## CHAPTER 2

### Theoretical and Conceptual Framework

## 2.1 Theoretical Background

This study begins by reviewing the literature of strategic alliances, which are becoming increasingly important in today's intensified competitive international business world. Next, the literature of organizational learning is incorporated with the perspective of innovation to provide an understanding of how learning takes place at the firm level. Lastly, the affecting of firm's learning on technology transfer and human resources development are examined.

### 2.1 .1 Strategic Alliances

Scholars in the field of international business view strategic alliances as a temporary mechanism for the expansion of multinational enterprises (Beamish, 1988; Contractor and Lorange, 1988; Osborn and Hagedoorn, 1977). However, studies in the topic of strategic alliances still lack consensus with the usage of the term "strategic alliances" (Simonnin, 1991).

Strategic alliances link specific facets of the businesses of two or more firms. At its core, this link is a trading partnership that enhances the effectiveness of the competitive strategies of the participating firms by providing for the mutually beneficial trade of technologies, skills and products. An alliance can take a variety of forms, ranging from an arm's length contact to a joint venture.<sup>1</sup>

Strategic alliances can have a variety of organizational arrangements, such as joint ventures, licensing agreements, distribution and supply agreements, research and development partnerships, and technical exchanges. Broadly speaking, the government structures of the various forms can be differentiated as either equity alliances or non-equity alliances. Equity alliances involve the transfer or creation of equity ownership either through direct investment or the creation of an equity joint venture. Non-equity alliances do not involve any transfer of equity nor do they usually entail the creation of a new organization. Strategic alliances represent a means for hungry firms to pursue their strategies despite limited

<sup>1</sup> Michael Y. Yoshino and U. Srinivasa Rangan. (1995). "Strategic Alliance: An Entrepreneurial Approach to

Globalization". Harvard Business School Press. pp.4-5

resources in some areas, basically envisioned as two or more organizations sharing resources to achieve some common business purposes.

Dunning (1988) argues that the motive for international alliances is to assist firms to globalize their value chain. Porter's value chain framework (1985) and his concept of five competitive forces (1980) helps to isolate alliances by type. In the value chain, this includes the support activities (firm infrastructure, human resource management, technology, development, procurement) and the primary activities (inbound logistics, operations outbound logistics, marketing, sales, and services).

Contractor and Lorange (1988) hypothesize a classification of cooperative arrangements based on inter-organizational dependence. These rank from a low to a high level of dependence and include cooperative arrangements, patent licensing, franchising, know-how licensing, management and marketing service agreements, research partnership, development co-production and equity joint ventures.

Pucik (1992) suggests that strategic alliances can take either a form of technical exchange and cross licensing, co-production and Original Equipment Manufacturing (OEM) agreement, sale and distribution ties, joint product development programs, or creation of joint venture firms

with equity distributed among the partners.

2.1.2 Organizational Learning

Organizational learning has been discussed in the literature for over 20 years (Argyris & Schön, 1978; Bateson, 1971; Simon, 1969). The term "organizational learning" has used since the 1970s. It came to be used to emphasize that organizations, just as individuals, can acquire new knowledge and skills with the intention of improving their future performance. Organizational learning and the importance of increasing knowledge have long been recognized as having a major impact on a firm's performance.

The theoretical approach by Argyris and Schön identifies the learning into 3 levels; higher, middle, and lower level of learning. The routine learning improvements within the boundaries of existing organizational knowledge as the 'lowest' level. The middle level involves changes to the boundaries or structures of existing knowledge bases, which imply a 'reframing' of organizational systems and perspectives. The highest level is learning how to learn through reflexive cognitive processes; it is proactive and generative. These three learning levels are as following table 2.1.

Table 2.1. Levels of organizational learning

Levels	Theoretical approach	Pragmatic approach
Higher	Learning; deutero learning	Strategic learning
	Learning how to learn so as to improve the quality of the organizational learning process itself.	Changes in managerial mindsets, especially in understanding the criteria and conditions for organizational success.
Middle	Reframing; double-loop	With an emphasis on learning.
	Changes of existing organizational frameworks. Involves questioning survival in changing environmental conditions.	How to achieve better integration of organizational activities.
Lower	Routine; single-loop	Technical learning
	Improvements and adjustments to optimize performance within the limits of existing organizational framework and system.	The acquisition of new specific techniques such as more advanced production scheduling, or managerial techniques such as more advanced selection tests.

Source: Argyris and Schön (1978), "Organizational Learning; Theory, Method, and Practice",

Addison-Wesley Publishing Company, p.118.



Argyris and Schön also argue that lower-level learning may be apparent from observing the actions that are taken and the structural changes are made. On the other hand, middle-level and higher-level learning represents changing associations, frames of reference and programs that beg a methodology that analyzes the more in-depth functioning of an organization.

In most international alliance firms in developing countries lower-level learning is the adjustment of overall firm's learning. There need more time and need long term effects and impact the whole organization to adopt to higher-level learning. Over time, every organization faces the need for renewal for skill and knowledge of its and basic capabilities.

Lyles & Mitroff (1980) argue that lower-level learning of local firm in developing countries is a result of repetition and routine and involves association building. Cyert and March (1963) identify standard operating procedures or success programs, goals, and decision rules as illustrative of learning based on routine work.

Duncan and Weiss's (1979) definition is offered here: "Organizational learning is defined as the process by which knowledge about action outcome relationships between the organization and the environment is developed." Organizations often adopt cooperative strategies with the specific intention of acquiring new knowledge and know-how. Successful cooperation itself requires a learning process by the partners (Inkpen, 1995a).

### 2.1.3 Penrose's theory

Penrose's theory of the growth of the firm emphasized the importance of firm's learning and its main argument was that the implementing technical change and manpower service (Penrose 1959).

Theoretically, this study aimed to present and illuminate Penrose's theory on technical change and manpower development of the firm. The reasons are

twofold. First, Penrose's arguments on the process of technical change of the firm and its growth have hitherto been isolated from and peripheral to mainstream industrial economic and business management literature such as theory of the firm, industrial organization, cooperate strategy, and innovation process. Second, with the integration of Penrose's theory, it can be argued that the organizational learning in international alliance can be very useful in understanding the process of technical change and manpower development of the firm in developing countries.

In Penrose's theory, she described a firm as a bundle of physical and human resources engaged in a collection of complementary activities which create wealth by processes, or by the final consumer for consumption. Moreover, the firm always operates in an environment which challenges its ability to match the performance of other firms by seeking to reduce unit costs, and by creating new products or continuously improving the dimensions of its existing product. Furthermore, the firm acts as a depository of experiential, practical and tacit knowledge.<sup>2</sup>

### 2.1.4 Technology Transfer

*The definition of technology transfer used here is "a learning process wherein technological knowledge is continually accumulated into human resources that are engaged in production activities; a successful technology transfer will eventually lead to a deeper and wider accumulation of knowledge."*

Technology transfer process is the learning process that eventually leads to an accumulation of knowledge in human resources. This implies that the process does not mean merely a physical transfer of production machinery or the setting up of a manufacturing plant, but rather a human capital formation through the accumulation of technological knowledge. In order that this leaning process results in

2 The Penrosian notion of the firm that produces both products and knowledge establishes her concept of the firm as "a learning theory of the firm". Richardson extends Penrose's theory of the firm to justify the need and existence for inter-firm. According to Richardson, firms will internalize similar activities and externalize

complementary activities through collaborative relations with other producers. Richardson (1972) provides the conceptual justification for inter-firm cooperation as an alternative to market (external) or hierarchical (internal) coordination (Best, 1990).



technological mastery, it has to expand in both “depth” and “width”<sup>3</sup>.

In a proper learning process, engineers, operators, or workers will continually gain a deeper understanding of the technology they are dealing with. This is termed a “deepening” effect. The levels of understanding can be divided into four interrelated stages : acquisitive capability, operative capability, adaptive capability, and innovative capability as described in the following.

#### *1) Acquisitive Capability*

This capability involves the ability of the firm to search for process or product technology, to assess the suitability of various possible choices, to conduct a feasibility analysis, to negotiate with the foreign supplier and procure the technology, to install the technology or production process in the factory, and to carry out the necessary test runs prior to start-up.

#### *2) Operative Capability*

This capability deals with the efficiency with which the firm is able to use and operate the technology once it has been acquired, and it may itself depend crucially on the understanding of the technology process that the firm acquired during the initial acquisition of the technology. The types of activities that characterize operative capability include process operation and control; quality control of both products and inputs; manpower development programs to enhance human capital and employee involvement; service, maintenance, and calibration procedures relating to machinery and equipment; inventory control of products, inputs, and spare parts; and subcontracting and input sourcing arrangements.

#### *3) Adaptive Capability*

This capability is reflected in the ability of the firm to carry out incremental modifications and improvements to existing plant and processes as well as minor product design changes. It generally requires the development of an in-depth knowledge of the product or process technology and is likely to involve

the establishment of a basic R&D facility, a product design facility, or both.

#### *4) Innovative Capability*

This capability is present when the firm can make radical or major modifications and improvements to products or processes or invent completely new products or processes.

Foreign investment helps to bring in new production technologies that generally do not exist previously in the country. In most cases, however, these technologies are fragmented and usually produce low value-added results, which indicates that the deepening effect alone will not help in the mastery of technology in the practical sense. The learning process must be extended to cover related and necessary areas. Developing countries would first have to master technology at the periphery, which is the part that most foreign investment would bring in, and gradually extend its learning process to cover to core technology. After the mastery of necessary technologies in such a process, the learning process would gradually be shifted to the more “high end” processes of components manufacturing and material processing.

### **2.1.5 Human Resources development**

Human Resource development (HRD) is the professional field that uses developmental practices to bring about more quality, higher productivity, and greater satisfaction among workers, managers, and other organization members. Human resource development is defined by its philosophy of development. HRD professionals are dedicated educated and prepared to assist employees, their managers, and others in the organization to increase the cost-effectiveness of individuals, groups, and systems.

Penrose (1959) discussed human resources that the development of skill and knowledge of manpower “will to a large extent determine the response of the

3 Prayoon Shiowattana, (1989), “Technology Transfer in Thailand’s Electronics Industry”, The University of

Tokyo press, pp. 174 -178.



firm to changes in the external world and also determine what it 'sees' in the external world (Penrose, 1959)." Penrose often emphasizes the essence of manpower through the concept of 'unused productive resources'. She contends that advantages accruing to one particular firm rather than to another tend to stem from the availability of unused resources (stock of skill and knowledge) within it. These potential resources are a driving force to innovate an incentive to expand, and a source of competitive advantage.

HRD has been described as "the integrated use of training and development, organization development, and career development to improve individual, group, and organizational effectiveness". HRD leads to the achievement of greater efficiency and contributes value to products and services<sup>4</sup>.

The core of HRD is in learning. There are many other human resources areas in organizations, but the uniqueness of HRD is its use of learning to reach the objectives of the individual and the organization. Although the major focus of HRD is on learning, provided by employers for employees, it is important to recognize the place of the employer. Without the employer there would not be HRD.

Nadler (1980) penetrates deeper into the organization of training and management actions by regarding input resources and activities within the training process as the main criteria for a management plan. Nadler explains that the activities in the training process can be considered with regard to the training type and duration. This illustrates how the activities in the training process are formed (if they use on-the-job training or formal training techniques), and how long each type of activity takes. Nadler also explains the training process needs against the availability of resources, both within and outside the organization. The categories of resources are mentioned as, personnel, instructors, finance, equipment and training facilities<sup>5</sup>.

## 2.2 Conceptual Framework and Research Model

This study's framework start by assuming that the nature of firm's learning depends on the difference between the knowledge in the local firms in the developing country and the knowledge in the foreign firms in the developed country. The developed country's firm transfers its advanced technology to the developing country's firm, through cooperation between alliance firms. Thus, international alliances are the channel of technology transfer.

There are several arguments concerning the different between the knowledge and technology level in firm. Although the managerial, behavioral, structural of the firm are built on different theoretical grounds, they share in common that firms can learn to accumulate knowledge and technology in order to develop its technical and human resource. So this study, attempts to explain the process of acquisition and accumulation of knowledge and technology, in which the organizational learning theory reveals a process of acquisition and accumulation of skill and knowledge.

This study attempted to illustrate two main theories, which originate the principle of the firm's learning affecting technology transfer and human resources development. First, the organizational learning theory generated by Argyris & Schön (1978) and other scholars in organizational learning literature. Second, Penrose's theory of the growth of firm (1959).

Even though the organizational learning theory approach and the Penrosian approach have been developed from different theoretical settings, they have one point in common. The common concept point is the learning process in firms.

Although these two approach yield considerable understanding about how firms can learn and grow, they do not sufficiently address the relationship between changes in firm's human resources abilities between industrial managers and their staff, and technological change after the technology is transferred in the firm.

4 R.Wayne Pace, Phillip c. Smith, Gordon E. Mills, (1991) "Human Resource Development", Prentice-Hall, Inc., p.2.

5 Leonard Nadler, Zeace Nadler, (1989), "Developing Human Resource", Tossey-Bass Pubsishers. pp. 9 -12.

### 2.2.1 Research Model

So far, there has not been such an organizational learning model that can be used as a management tool in order to manage human resources and improve technology transfer. For these reasons, this study would like to study and develop an organizational learning models of the factors affecting technology transfer and human resources development among alliance firms.

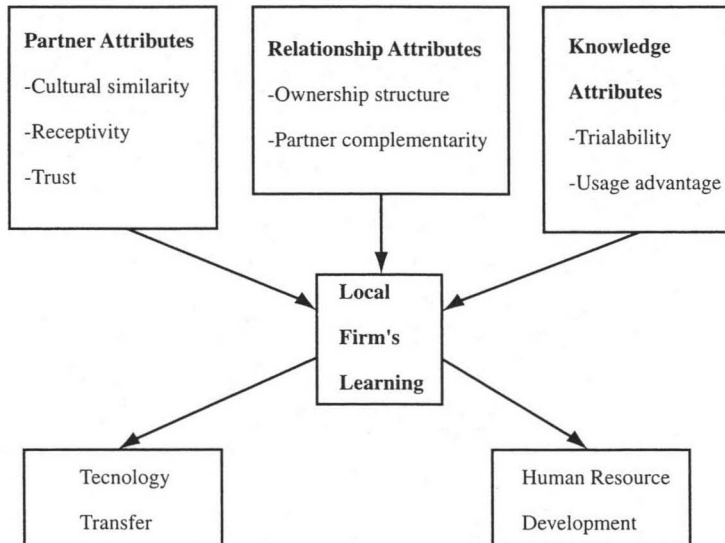
In this study, three groups of independent variables will be identified as partner attributes (Cultural similarity, Receptivity, Trust), relationship attributes (Ownership structure, Partner ↗

complementarity), and knowledge attributes (Trialability, Usage advantage). These three attributes will involve technological collaborations and human resources development at the practical level.

The conceptual framework guiding this study has been developed in the research model process diagrammed in figure 2.1.

Figure 2.1 represents the framework for determining if local firm's learning occurred and what learning occurred as a result of international alliance in local firms in production process activities. The figure shows the inter-relatedness of firm's learning and the roles that firm's learning plays in improvement of technology transfer and human resources development. ↗

Figure 2.1 The model of local firm's learning



#### The variables of local firm's learning

In the model of local firm's learning, three dependent variables are categorized as relating to the partner firm's attributes, partners' relationship attributes, and knowledge attributes. These variable are conducted in the questionnaires survey for Thai and Japanese executives or engineers was indicated as follows:

#### 1) Partner attributes

I hypothesize that factors involving partner attributes ↗

such as cultural similarity (e.g., Schein, 1985; Contractor and Lorange, 1988), receptivity (e.g., Hamel, 1990), and trust (e.g., Badaracco, 1991) positively relate to the local partner firm's learning. These three variables have received a considerable amount of recent attention in the literature of strategic alliance focusing on the technological collaboration. It has been conceptualized in previous studies that these characteristics of partner firms enhance knowledge acquisition and learning.

#### ● Cultural similarity

Cultural similarity refers to the degree to which one perceives another party as similar to one's own group in

perceptual and behavioral patterns (Kim, 1991). Partners may hesitate to openly communicate and exchange information when they believe that the other party holds dissimilar frames of reference for interpreting, understanding, and signaling (Geringer, 1988b). Highly dissimilar partners would need to expend greater efforts and resources toward learning (Parkhe, 1997). The internal integration of individuals within a shared culture facilitates learning (Schein, 1985).

### ● *Receptivity*

Receptivity is the capacity of organizations to learn from their partners (Hamel, 1990). Spinello (1998) proposes that strengths and capabilities of a firm's resources concern the limitation or opportunity to import knowledge from outside. Companies with a strong internal awareness will know what to look for as they scan their external environments. Knowledge enclaves arise where there is no sharing within the firm. As a result, few employees benefit from knowledge that has been cultivated within the corporate hierarchy.

### ● *Trust*

Trust is the incentive for partner firms to mutually forbear (Madhok, 1995), ensuring a sound and cooperative working relationship between the partners. The higher the trust, the more efficient the alliance will be in the transformation of the input of cooperation into a collaborative output (Buckley and Casson, 1988). Trust is essential for the development of enduring partnerships (Williamson, 1985; Morgan, 1994) because it facilitates constructive dialogue and cooperative problem solving (Pruitt, 1981). Firms are limited in their learning by the willingness of external sources to fully cooperate (Pisano, 1988). Inkpen (1998) suggests that increasing trust between alliance partners may mitigate partner protectiveness.

## 2) Relationship Attributes

Relationship attributes such as ownership structure and complementarity between partners have been conceptualized as important factors creating synergy from collaboration. It has been argued that these factors positively influence learning of partner firms in alliances

since they provide an opportunity to access and to complement the partner's knowledge, as well as providing a basic understanding about the partner's skills.

### ● *Ownership structure*

The ownership structure in this study refers to the alliance firms whose capital is shared by two or more organizations. Each partner expects a proportionate share of dividends as compensation and each activity participates in decision-making activities (Contractor and Lorange, 1988; Geringer, 1988).

There is an argument regarding which ownership form enables the flow of knowledge transfer. It is suggested that non-equity collaborations are less committed forms of involvement than equity collaborations and offer greater flexibility, as entry and exit standards are lower (Harrigan, 1983). On the other hand, equity collaborations are considered an important measure by which partners address their concerns about malfeasance in alliances (Gulati, 1995a). Lyles and Salk (1997) empirically found that shared ownership influenced the degree of knowledge acquisition. The structure of the relationship determines the barriers and gateways to the inter-organizational knowledge flow (Tiemessen, 1997). The equity alliances potentially offer the highest degree of inter-firm cooperation because the owners have a legal right to jointly manage the alliances and they jointly assume the risk (Tiemessen, 1997).

### ● *Partners complementarity*

Dymsza (1988) suggests that factors involved in the success and failures of alliances in developing countries include complementarity and synergy of contributions by partners. In other words, when members contribute dissimilar resources, it may create a synergy that leads to alliance success (Hamel, 1991). The diversity between partners will have implications for what they need to learn (Parkhe, 1991). Partner perceptions of unequal contribution in strategic alliances are also another reason for failure. Complementarity involves the uniqueness and symmetry dimensions of partners' resource contributions to the alliance (Johnson, 1997). A lack of strategic symmetry destabilizes the relationship.

### 3) Knowledge Attributes

Knowledge has become the most important or strategic factor of production (Spender, 1996). It is clear that knowledge is an essential element in learning (Joo, 1998). Transferred knowledge can reside in design, production, installation, sales and distribution, operation and maintenance, or management (Zander and Kogut, 1995). Information is always pooled when firms cooperate. The extent to which a firm can truly internalize new skills and techniques may be partially dependent on the attributes or characteristics of the technology (Steensma, 1996).

#### ● Trialability

Rogers and Shoemaker (1971) suggest that the trialability of innovation affects the rate of adoption of innovation. Trialability is the degree to which an innovation may be experimented with on a limited basis. New ideas, which can be tried on the installment plan, will generally be adopted more quickly than innovations, which are not divisible. Larson (1992) suggests that incremental movement that edges organizations and individuals closer and closer characterizes the trial phase of the network's operation. In the process, explicit and implicit rules begin to emerge. Rogers (1983) argues the same thing and adds that innovation that is able to be trialed represents less uncertainty to the individual who is considering it for adoption, as it is possible to learn by doing.

#### ● Usage advantage

Firms collaborate to get access to resources they otherwise could not secure (Hamel, 1991). Commitment develops largely as a function of perceived benefits of the relationship (Cullen, Johnson, and Sakano, 1995). Levitt and March (1988) have observed that the behavior of firms depends on the relationship between the outcomes they observe and the aspirations they have for those outcomes. Organizational actions adapt to experience incrementally in response to feedback about the outcomes. When confronted with learning opportunities, the firm may see little need to change

behavior and thus become trapped by their distinctive competence (Levinthal and March, 1993). Rogers and Shoemaker (1971) suggest the concept of relative advantage of technology, which is viewed in this study as the usage advantage of the knowledge.

#### The variables concerning local employees in the improvement of production efficiency

In this study, the factors affecting local employee's production efficiency improvement are assumed as the local employee's job satisfaction and foreign partner's job suggestion and technology transfer that were the effect of local firm's learning at the individual worker level. Organizational theories address process measures such as job satisfaction and top management suggestion performance in technology transfer process which influences a local worker's learning (Parkhe, 1991; Harrigan, 1985; Killing, 1983; Kogut, 1988).

It is constructive to view effectiveness of the international alliance firms in terms of the factors that effect local firm's learning. The factors that may effect overall effectiveness are the top management characteristics and the bottom-level worker characteristics. The summary of factors affecting local firm's learning at individual worker level are as follows.

#### 1) Local employee's job satisfactions

Employee's job satisfactions are considered highly important by most organization. Furthermore, the overall job satisfaction of the employee is one of the success factors for organizations. Satisfied employees are a precondition for increasing productivity, responsiveness, customer services and quality. In addition, to provide product or service satisfaction, the satisfied employees should serve customers. Employee satisfaction could be surveyed or measured by different methods such as involvement with decisions, recognition for doing a good job, access encouragement to be creative and use initiative, support level from staff functions, and overall satisfaction with the company. In this study, the job satisfactions are work principles, work environment, work responsibility and job position, salary or per diem, holiday or rest period, promotion

and authority limitation, response to parent company's regulation and relationship with foreign staff.

## 2) Foreign partner's job suggestion and technology transfer

The effectiveness of technology transfer in international alliance firms requires both partners to sustain an active effort. That is, the donor of technology should manifest its willingness to transfer, while the recipient should develop its ability to absorb the knowledge. All of the activities that both partners take will incur costs. The learning opportunities will arise when each partner inten to transfer knowledge and technology into a cooperative relationship.

Therefore, the performance of foreign partners who conducting and suggesting various activities to ensure the transfer of know-how and technology in this regard needs to be highlighted. There must be a willingness by the foreign partner to transfer technology to local alliance firms. Therefore, it can be said that the success of technology transfer depends on the willingness of such activities, which involve the transfer of knowledge from

foreign partner to local partner. Top management characteristics in technology transfer are often seen as an important factor for providing the leadership to effectively achieve the goals of the organization. In this study foreign employee's suggestion and technology transfer was provided as enthusiasm, ability in training, suggestion and transferring technology, leadership, cooperation in the organization, motivation in work development and work responsibility.

## CHAPTER 3

### Data Analysis and Conclusion

This chapter reports the results of the data analysis and conclusion. Firstly, discussion of data analysis and the hypotheses testing are conducted. Finally, conclusion of the study is provided.

The analysis of the characteristics of Thai and Japanese executives and Thai local workers classified by demographic data are as following table 3.1

Table 3.1 Characteristics of respondents and alliance firms

characteristics	Respondents/Organizations	N	Percent
Questionnaires sent	Executives and Workers	1,000	100
Responses	Thai executives and Japanese executives	165	16.5
	Thai local worker	204	20.4
Industry of respondents	Electrical and electronics parts	175	17.5
	Automotive parts	158	15.8
	Both industries	36	3.6
characteristics	Respondents/Organizations	N=165	Percent
Motive of alliances	Financial assistance		34.3
	Technology assistance		90.2
	Marketing knowledge		58.8
	Other (e.g., Raw materials)		10.8
Employees who was sent to train in foreign country	None		24.7
	1-5 people		58.0
	6-10 people		16.7
	11% or above		0.6
Proportion of Japanese executives and specialist	None		0.0
	1-5 people		53.7
	6-10 people		33.3
	11% or above		13.0



### 3.1 Hypotheses Testing

This study used the multiple regression analyses to test five hypotheses of local firm's learning and the linear structural relationship equation model (LISREL model) is used to explain the cause-effect relationship of the role of local firm's learning on technology transfer and human resource development in Thai and Japanese alliance firms.

The hypotheses of the local firm's over all learning concern the relationships between dependent variables (firm's learning, technology transfer and human resources development) and its independent variables (partnership attributes, relationship attributes and knowledge attributes, i.e., cultural similarity, receptivity, trust, ownership structure, complementarity, trialability and usage advantage).

Moreover, the local firm's learning at an individual worker level concerns the relationships between the dependent variable (local employee's production efficiency improvement) and its independent variables

(local employee's job satisfactions and foreign partner's job suggestion and technology transfer).

The hypotheses testing mentioned above are presented as follows.

#### ● Hypothesis 1

**H1: The greater the degree of partner attributes, the higher the firm's learning and the greater improvement in technology transfer and human resource development.**

- 1.1 Cultural similarity significantly affects the firm's learning and improvement in technology transfer and human resource development.
- 1.2 Receptivity significantly affects the firm's learning and improvement in technology transfer and human resource development.
- 1.3 Trust significantly affects the firm's learning and improvement in technology transfer and human resource development.

Table 3.2 Dependent and Independent variables of hypothesis 1

Independent variables		Dependent variables	
Partner Attributes	Indicators	Variables	Indicators
V1: Cultural Similarity	-Congruence in value and norm -Compatible philosophy	V4: Local Firm's Learning	Overall learning -Production efficiency improvement -Production technology improvement -Production know-how and production skill improvement -More convenience and better communication among partners
V2: Receptivity	Knowledge transfer activities -In-house training -Off-house training -On-the-job training -Training aboard -Conference, meeting and memo, report Firm's strength -Financial strength -Human resource development -Production technology development -Production management and quality control -Ability to use foreign language to communicate -Executive's interest in advancing employees' knowledge -Regulation and government relations	V5: Technology Transfer	Production standard development -Product design patents -Thailand Industrial Standards (TIS) certificate -ISO 9000 series -ISO 14000 series -TIS 18000 (occupational health and safety management)
V3: Trust	-Trust and rely that partner are capable and component -Trust and allow local employees access to promotion	V6: Human Resources Development	Productivity and manpower development -Defective rate improvement -Return product improvement -Machine's capacity utilization -Number of R&D project -Man-hour production improvement

Table 3.3 The correlation and square multiple correlation of dependent and independent variables

Correlation			Estimate
V1	<-->	V2	0.501
V2	<-->	V3	0.643
V1	<-->	V3	0.530
Squared Multiple Correlation( $R^2$ )			Estimate
V1, V2, V3	-->	V4	0.514
V1, V2, V3	-->	V6	0.129
V1, V2, V3	-->	V5	0.175

Whereas: - correlation value is among -1.00 and 1.00

0.80 - 1.00 = high relationship

0.60 - 0.79 = quite high relationship

0.40 - 0.59 = medium relationship

0.20 - 0.39 = quite low relationship

0.00 - 0.19 = low relationship

Table 3.4 The regression weights of dependent and independent variables

Regression Weights			Estimate	S.E.	C.R.	P
V4	<--	V1	0.593	0.228	2.598	0.009
V4	<--	V2	0.372	0.083	4.473	0.000
V4	<--	V3	0.888	0.196	4.526	0.000

Whereas: -

S.E.= Standard Error

C.R.= Critical Ratio

P = Level of significance

Remark: statistics significance at 0.05 ( $\alpha = 0.05$ ).

The consistency between empirical data and the linear structural relationship model in this model were not different from zero at the 0.05 significance level when  $p \leq 0.05$

Table 3.5 The standardized regression weights of dependent and independent variables

Standardized Regression Weights ( $\beta$ )	V3	V2	V1	V4
V4	0.339	0.328	0.172	0.000
V6	0.122	0.118	0.062	0.359
V5	0.142	0.137	0.072	0.419

### ● The Hypothesis 1 testing

Hypothesis 1 tested whether partner attributes (cultural similarity, receptivity and trust) were the factors influencing the firm's learning. Whereas, the partner attributes (cultural similarity, receptivity and trust) were independent factors effecting each relationship to the other. The correlation matrix indicated that cultural similarity related positively to receptivity (correlation = 0.501), receptivity related positively to trust (correlation = 0.643), and cultural similarity related positively to trust (correlation = 0.530). This indicated that the relationship between receptivity and trust is quite high, whereas the relation between cultural similarity and receptivity and the relationship between cultural similarity and trust are approximately at the medium level as illustrated in table 3.3.

When considering the independent variable as cultural similarity, it is found that cultural similarity was the factor directly affecting a firm's learning at the 0.05 significance statistic level ( $p = 0.009$ ) where the critical ratio is 2.598 and the standardized regression weight is 0.172 as illustrated in table 3.4 and table 3.5.

Considering the independent variable as receptivity, in this analysis receptivity was knowledge transfer activities and a firm's strength. Receptivity factors (knowledge transfer activities and firm's strength) were significant to a firm's learning and affected technology transfer and the human resources development. It is found that receptivity was the factor directly affecting the firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ), where the critical ratio is 4.473 and the standardized regression weight is 0.328 as illustrated in table 3.4 and table 3.5.

Considering the independent variable as trust, the multiple regression analysis indicated that the relationships between trust and firm's learning were positive and consistent with the hypothesis. It is found that trust was the factor directly affecting the firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ), where the critical ratio is 4.526 and the standardized regression weight is 0.339 as illustrated in table 3.4 and table 3.5.

The hypothesis testing also revealed that the partner attributes (cultural similarity, receptivity and trust) significantly affected the firm's learning. The correlation between partner attributes (cultural similarity, receptivity and trust) and firm's learning positively affected the firm's learning at 51.4% (squared multiple correlation = 0.514). And partner attributes (cultural similarity, receptivity and trust) indirectly influenced the dependent variable (technology transfer and of human resources development) at 17.5% and 12.9% (square multiple correlation = 0.175 and 0.129 respectively) as illustrated in table 3.3.

The multiple regression analysis indicated that the relationships between firm's learning and technology transfer and human resources development were positive (standardized regression weight = 0.419 and 0.359 respectively) as illustrated in table 3.5.

This result shows that the relationship between firm's learning, technology transfer and human resource development were positive as hypothesized in hypothesis 1. It indicates that all of the independent variables of partner attributes (cultural similarity, receptivity and trust) could predict all dependent variables (firm's learning, technology transfer and human resources development). Thus, the hypothesis 1 is supported by the data as shows in the following figure 3.1.

Figure 3.1 The analysis of linear structural relationship in hypothesis 1

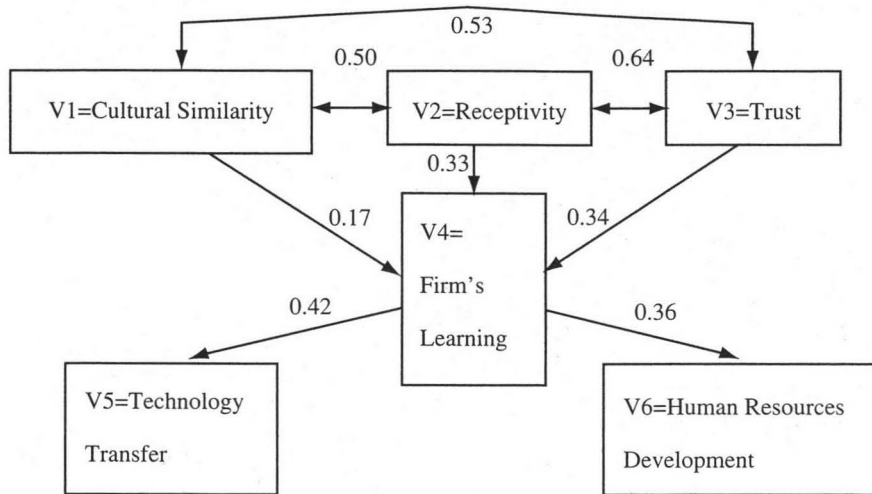


Figure 3.1 illustrates that partner attributes affecting firm's learning and their influences on technology transfer and human resources development.

The Linear Structural Relationship Equation Model in the terms of statistics significance ( $\alpha = 0.05$ ) are as follows:<sup>1</sup>

$$V4 = 0.172(V1) + 0.328(V2) + 0.339(V3) \quad V5 = 0.072(V1) + 0.137(V2) + 0.142(V3)$$

$$V6 = 0.062(V1) + 0.118(V2) + 0.122(V3)$$

## ● Hypothesis 2

**H2: The greater the degree of relationship attributes, the higher the firm's learning and the greater improvement in technology transfer and human resources development.**

2.1 Ownership structure significantly affects the firm's learning and improvement in technology transfer and human resources development.

2.2 Partner complementarity significantly affects the firm's learning and improvement in technology transfer and human resources development.

Table 3.6 Dependent and Independent variables of hypothesis 2

Independent variables			Dependent variables
Relationship Attributes	Indicators	Variables	Indicators
V7: Ownership Structure	-Dominant Thai partner capital shareholder -Dominant Japanese partner capital shareholder	V4: Local Firm's Learning	Overall learning -Production efficiency improvement -Production technology improvement -Production know-how and production skill improvement -More convenience and better communication among partners
	-Thai partner contributions -Japanese contributions	V5: Technology Transfer	Production standard development -Product design patents -Thailand Industrial Standards (TIS) certificate -ISO 9000 series -ISO 14000 series -TIS 18000 (occupational health and safety management)
		V6: Human Resources Development	Productivity and manpower development -Defective rate improvement -Return product improvement -Machine's capacity utilization -Number of R&D project -Man-hour production improvement

Table 3.7 The correlation and square multiple correlation of dependent and independent variables

Correlation			Estimate
V7	<-->	V8	0.072
Squared Multiple Correlation ( $R^2$ )			Estimate
V7, V8	-->	V4	0.425
V7, V8	-->	V6	0.142
V7, V8	-->	V5	0.193

Table 3.8 The regression weights of dependent and independent variables

Regression Weights			Estimate	S.E.	C.R.	P
V4	<--	V7	-0.066	0.019	-3.561	0.000
V4	<--	V8	1.247	0.143	8.745	0.000
V5	<--	V4	0.113	0.018	6.256	0.000
V6	<--	V4	0.026	0.005	5.213	0.000

Table 3.9 The standardized regression weights of dependent and independent variables

Standardized Regression Weights ( $\beta$ )	V8	V7	V4
V4	0.555	-0.211	0.000
V6	0.209	-0.080	0.377
V5	0.244	-0.093	0.439

### ● The Hypothesis 2 testing

Hypothesis 2 tested whether relationship attributes (ownership structure and partner complementarity) were the factors influencing the firm's learning. Whereas, the relationship attributes (ownership structure and partner complementarity) were the independent factors which affect the relationship to each other. The correlation matrix indicated that ownership structure related positively to partner complementarity (correlation = 0.072). However, this indicated that the relationship between ownership structure and partner complementarity is low as illustrated in table 3.7.

When considering the independent variable as

ownership structure (dominant Thai capital share holder and dominant Japanese capital share holder), it is found that the ownership structure was the factor directly affecting firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ) which the critical ratio = -3.561 and the standardized regression weights ( $\beta$ ) = -0.211 as illustrated in table 3.8 and table 3.9.

However, the direction of the ownership structure affecting firm's learning was the reverse of the hypothesis. This indicated that the greater the degree of ownership structures, the lower the firm's learning. It indicated that the variables of ownership structure couldn't predict the firm's learning. Thus, hypothesis 2.1 was not supported by the data.

Considering the independent variable as partner complementarity, in this analysis, partner

complementarities were Thai partner managerial resource contributions and Japanese partner managerial resource contributions. It is found that partner complementarity was the factor directly affecting the firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ), where the critical ratio is 8.745 and the standardized regression weight is 0.555 as illustrated in table 3.8 and table 3.9. Thus, hypothesis 2.2 was supported by the data.

The hypothesis testing also revealed that the relationship attributes (ownership structure and partner complementarity) significantly affected the firm's learning. The correlation between relationship attributes (ownership structure and partner complementarity) and firm's learning positively affected the firm's learning at 42.5% (squared multiple correlation = 0.425). And ↗

the relationship attributes (ownership structure and partner complementarity) indirectly influenced the dependent variable (technology transfer and of human resources development) at 14.2% and 19.3% (square multiple correlation = 0.142 and 0.193 respectively) as illustrated in table 3.7.

The multiple regression analysis indicated that the relationships between firm's learning and technology transfer and human resources development were positive (standardized regression weight = 0.439 and 0.377 respectively) as illustrated in table 3.9.

This result shows that the relationship between firm's learning, technology transfer and human resources development were positive as hypothesized in hypothesis 2. Thus, the hypothesis 2 was partially supported by the data as shows in the following figure 3.2. ↗

Figure 3.2 The analysis of linear structural relationship in hypothesis 2

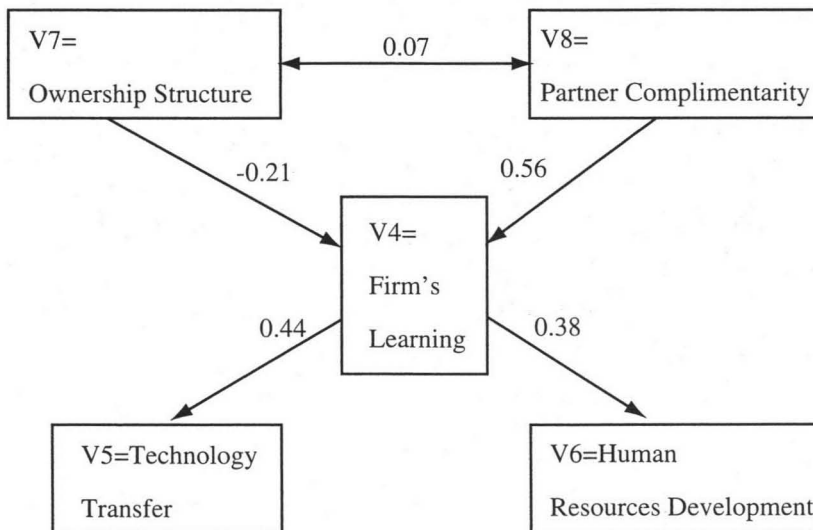


Figure 3.2 illustrates the relationship attributes affecting firm's learning and their influences on technology transfer and human resources development.

The Linear Structural Relationship Equation Model in the terms of statistics significance ( $\alpha = 0.05$ ) are as follows:

$$V4 = -0.211(V7) + 0.555(V8) \quad V5 = -0.093(V7) + 0.244(V8) \quad V6 = -0.080(V7) + 0.209(V8)$$

### ● Hypothesis 3

**H3: The greater the degree of knowledge attributes, the higher the firm's learning and the greater the improvement in technology transfer and human resources development.** ↗

3.1 Trialability significantly affects the firm's learning and improvement in technology transfer and human resources development.

3.2 Usage advantage significantly affected the firm's learning and improvement in technology transfer and human resources development.

Table 3.10 Dependent and Independent variables of hypothesis 3

Independent variables		Dependent variables	
Knowledge Attributes	Indicators	Variables	Indicators
V9: Triability	-Working procedures are able to be learn by working in production line -This technology improves the efficiency of the firm's production process	V4: Local Firm's Learning	Overall learning -Production efficiency improvement -Production technology improvement -Production know-how and production skill improvement -More convenience and better communication among partners
V10: Usage Advantage	-Cost and benefit are appropriate -Suitable to both domestic and international markets	V5: Technology Transfer	Production standard development -Product design patents -Thailand Industrial Standards (TIS) certificate -ISO 9000 series -ISO 14000 series -TIS 18000 (occupational health and safety management)
		V6: Human Resources Development	Productivity and manpower development -Defective rate improvement -Return product improvement -Machine's capacity utilization -Number of R&D project -Man-hour production improvement

Table 3.11 The correlation and square multiple correlation of dependent and independent variables

Correlations			Estimate
V9	<-->	V10	0.738
Squared Multiple Correlations ( $R^2$ )			Estimate
V9, V10	-->	V4	0.448
V9, V10	-->	V6	0.129
V9, V10	-->	V5	0.175

Table 3.12 The regression weights of dependent and independent variables

Regression Weights			Estimate	S.E.	C.R.	P
V4	<--	V9	1.661	0.451	3.681	0.000
V4	<--	V10	1.031	0.221	4.660	0.000
V5	<--	V4	0.113	0.019	5.905	0.000
V6	<--	V4	0.026	0.005	4.921	0.000

Table 3.13 The standardized regression weights of dependent and independent variables

Standardized Regression Weights ( $\beta$ )	V10	V9	V4
V4	0.401	0.316	0.000
V6	0.144	0.114	0.359
V5	0.168	0.133	0.419



### ● The Hypothesis 3 testing

Hypothesis 3 tested whether knowledge attributes (trialability and usage advantage) were the factors influencing the firm's learning. Whereas, the knowledge attributes (trialability and usage advantage) were the independent factors which effect the relationship to each other. The correlation matrix indicated that trialability related positively to usage advantage (correlation = 0.738). This indicated that the relationship between trialability and usage advantage is high as illustrated in table 3.11.

When considering the independent variable as trialability, it is found that trialability was the factor directly affecting the firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ) where the critical ratio = 3.681 and the standardized regression weights ( $\beta$ ) = 0.316 as illustrated in table 3.12 and table 3.13.

Considering the independent variable as usage advantage, it is found that usage advantage was the factor directly affecting the firm's learning at the 0.05 significance statistic level ( $p = 0.000$ ) where the critical ratio is 4.660 and the standardized regression weight ( $\beta$ ) is 0.401 as illustrated in table 3.12 and table 3.13.

The hypothesis testing also revealed that the knowledge attributes (trialability and usage advantage) significantly affected the firm's learning. The correlation between knowledge attributes (trialability and usage advantage) and a firm's learning positively affected the firm's learning at 44.8% (squared multiple correlation = 0.448). And the knowledge attributed (trialability and usage advantage) indirectly influenced the dependent variables (technology transfer and human resources development) at 17.5% and 12.9% (square multiple correlation = 0.175 and 0.129 respectively) as illustrated in table 3.11. The multiple regression analysis indicated that the relationships between a firm's learning and technology transfer and human resources development were positive (standard regression weight = 0.419 and 0.359 respectively) as illustrated in table 3.13.

This result shows that the relationship between firm's learning, technology transfer and human resources development were positive as hypothesized in hypothesis 3. It indicated that all of the independent variables of knowledge attributed (trialability and usage advantage) could predict all dependent variables (firm's learning, technology transfer and human resources development). Thus, the hypothesis 3 was supported by the data as shows in the following figure 3.3.

Figure 3.3 The analysis of linear structural relationship in hypothesis 3

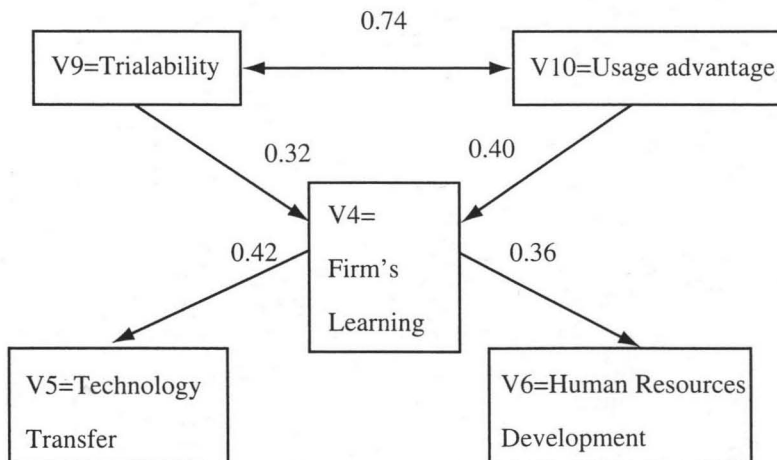


Figure 3.3 illustrates that relationship attributes affecting firm's learning and their influences on technology transfer and human resources development.

The Linear Structural Relationship Equation Model in the terms of statistics significance ( $\alpha = 0.05$ ) are as follows:  
 $V4 = 0.316(V9) + 0.401(V10)$      $V5 = 0.133(V9) + 0.168(V10)$      $V6 = 0.114(V9) + 0.144(V10)$

Table 3.14 Dependent and Independent Variables of Hypothesis 4 and Hypothesis 5

Independent variables		Dependent variables	
Indicators	Variables	Indicators	Variables
<b>Local employee's job satisfaction</b>	Local employee's job satisfactions -Work principles and values -Work environment -Work responsibility and job position -Salary, per diem -Holiday, rest period -Promotion and authority limitations -Response to parent company's regulation -Relationship with Japanese staff	<b>Local employee's production efficiency improvement</b>	-Product quality development -Improvement of production system -Production-cost reduction -Improvement of skill and know-how
<b>Foreign employee's job suggestion and technology transfer</b>	Japanese employee's job suggestion and technology transfer -Enthusiasm -Ability in training, job suggestion and transfer technology -Leadership -Cooperation in the organization -Motivation in work development -Work responsibility		

Table 3.15 The correlation of dependent and independent variables

Correlation		Local employee's job satisfaction	Japanese employee's job suggestion and technology transfer	Local employee's production efficiency improvement
Local employee's job satisfactions	Pearson Correlation	1.000	0.460	0.212
	Significant (2-tailed)		0.000	0.003
Japanese employee's job suggestion and technology transfer	Pearson Correlation	0.460	1.000	0.495
	Significant (2-tailed)	0.000		0.000
Local employee's production efficiency improvement	Pearson Correlation	0.212	0.495	1.000
	Significant (2-tailed)	0.003	0.000	
*Correlation is significant at the 0.01 level (2-tailed)				

Table 3.16 The regression weights and standardized regression weights

Regression Weights			Estimate	S.E.	C.R.	P
V3	<--	V2	0.288	0.04	7.123	0.000
V3	<--	V1	-0.006	0.029	-0.19	0.850
Squared Multiple Correlations ( $R^2$ )			Estimate			
V1, V2	-->	V3	0.236			
Standardized Regression Weights ( $\beta$ )		V1	V2			
V3		-0.013	0.492			

Whereas: -

- V1 = Local employee's job satisfaction
- V2 = Japanese employee's job suggestion and technology transfer
- V3 = Local employee's production efficiency improvement

● Hypothesis 4 and Hypothesis 5 testing

**Hypothesis 4**

**H4: The local employee's job satisfaction significantly affects local employee's production efficiency improvement.**

**Hypothesis 5**

**H5: The greater the foreign partner offers job suggestion and technology transfer, the greater the local employee's production efficiency improvement.**

● The Hypothesis 4 and Hypothesis 5 testing

**Hypothesis 4**

Hypothesis 4 tested whether the local employee's job satisfaction significantly affects the local employee's production efficiency improvement. The regression weight indicated that the local employee's job satisfaction related negatively to the local employee's production efficiency improvement at the 0.01 significance statistic level ( $p = 0.003$ ) with the critical ratio = -0.19 and the standardized regression weight ( $\beta$ ) = -0.93. This indicated that the relationship between the local employee's job satisfaction and the local employee's production efficiency improvement was negative as illustrated in table 3.16.

Hence, the direction of the local employee's job satisfaction significantly affecting the local employee's production efficiency improvement was the reverse of the hypothesis. This indicated that the local employee's

job satisfaction was not the factor significantly affected the local employee's production efficiency improvement. It indicated that the variables of local employee's job satisfaction couldn't predict the local employee's production efficiency improvement. Thus, the hypothesis 4 was not supported by the data as shows in the following figure 3.4.

**Hypothesis 5**

Hypothesis 5 tested whether the Japanese employee's job suggestion and technology transfer was the factor influencing the local employee's production efficiency improvement. When considering the independent variable as the Japanese employee's job suggestion and technology transfer, it is found that Japanese employee's job suggestion and technology transfer was the factor directly affected the local employee's production efficiency improvement at the 0.01 significance statistic level ( $p = 0.000$ ) which the critical ratio = 7.123 and the standardized regression weights ( $\beta$ ) = 0.429 as illustrated in table 3.16.

The multiple regression analysis indicated that the relationships between the Japanese employee's job suggestion and technology transfer and the local employee's production efficiency improvement were positive as hypothesized in hypothesis 5. It indicated that the Japanese employee's job suggestion and technology transfer could predict the dependent variables (the local employee's production efficiency improvement). Thus, the hypothesis 5 was supported by the data as shows in the following figure 3.4.

Figure 3.4 The analysis of linear structural relationship in hypothesis 4 and 5

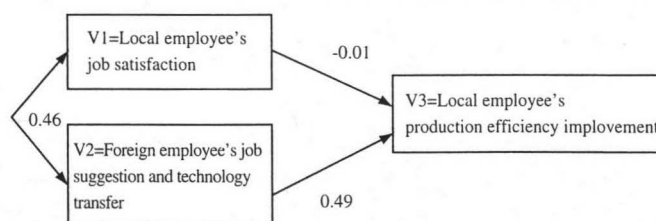


Figure 3.4 illustrates the factors affecting local employee's production efficiency improvement.

The Linear Structural Relationship Equation Model in the terms of statistics significance ( $\alpha = 0.01$ ) is as follow:

$$V3 = -0.013(V1) + 0.492(V2)$$

Remark: statistics significance at 0.01 ( $\alpha = 0.01$ ).

The consistency between empirical data and the linear structural relationship model in this model were not different from zero at the 0.01 significance level when  $p \leq 0.01$

### 3.2 Conclusion

In this study, the empirical study emphasized that strategic alliances are mechanisms for organizational learning. Otherwise, when international alliance firms are formed to exploit inter-firm differences in skills, know-how and technology, there is always the risk that the local partner may lack the capability to acquire the foreign partner's technology. The focus is on how local Thai partners exploit and leverage alliance knowledge and whether the firm's learning occurs.

The multiple regression analyses revealed that firm's learning was explained well when it was the measured in terms of a subjective perception such as the overall organizational learning perception. When learning was measured in terms of an objective perception such as the productivity improvement (percentage decrease or increase of productivity) or the technology change (number of production standard certification or new production design). These results suggest that it is plausible to argue that the local firms in Thailand are good learners.

Thw conclusions on the role of a firm's learning on technology transfer, human resources development and production efficiency improvement are as follows.

#### 3.2.1 Local Firm's Learning

In this study, the local firm's learning includes the improvement of the local firms in terms of production efficiency, production technology, changes in manufacturing, changes in understanding, and better environment. the firm's learning is an appropriate measure of learning of the local firms in the context of Thailand where manufacturers still need to upgrade their production process in order to be competent and acceptable in the world market. New world rules of trade and trade liberalization have forced Thai manufacturers to improve production efficiency, to develop new technology for development of manufacturing, and to provide better work environments.

In the multiple regression analysis, the firm's learning is significantly influenced by cultural similarity, receptivity trust, partner complementarity, trialability and

usage advantage. In the LISREL's path analysis, cultural similarity, receptivity, trust, partner complementarity, trialability, and usage advantage positively related to the local firm's learning as hypothesized. Whereas, the analysis shows that ownership structure negatively related to the local firm's learning.

The discussions on ownership structure can be supported by the "Master Plan for Industrial Development of Thailand" (TDRI; Thailand Development Research Institute, 1997). It is reported that the manufacturing industries in Thailand rely on imported technology and many Thai factories are engaged in wholesale import of technology from abroad even when they have no previous experience in that technology or production process. Despite a high volume of technology imports, the development of indigenous technology by the Thais has been slow. Most Thai partners in international alliance firms need technology transfer from foreign partner and rely on suggestions or instructions in the new production technology processes from foreign partner. However, the more they rely on foreign partner the less they can make their new ideas of innovations or their own research and development (R&D).

International alliance firms between Thai and Japanese firms that have dominant Japanese capital share holder are the majority of applications submitted and approved for promotion certificates issued by the BOI during 1985-1999. As in this study, the majority group of firms shows the Japanese-base capital of ownership structure between Thai and Japanese alliance firms (the dominant Japanese capital share holder ratio are approximately 60-80%). These alliance firms usually have management staffs that are composed almost completely of Japanese executives because Japanese partners do not wish to lose their control over a firm's management.

It may not be possible to accomplish firm's learning efficiently and effectively because the partner who has the dominant capital share and new technology does not wish to lose their control over the new knowledge and technology. This can, obviously, become counter-productive to the success of the cooperative alliances, which almost certainly requires mutual learning in order to achieve other strategic

objectives as well. The other problem is more likely to arise when foreign partner is gaining local market access in return for providing superior knowledge and technology to the other such as a typical situation for alliances between organizations from developed and developing countries respectively. When the dominant capital share is held by the foreign partner, organization is superseded by new technology and practices brought in by foreign partner, and the consequent threat to the local partner identity of the former may generate considerable resistance to internalizing the firm's learning.

In summary, the results of the analyses imply that the partner attributes and the knowledge attributes play major roles in the improvement of a local firms' production-related operation. The relationship attributes partly contribute to the firm's learning of local firms. Partner complementarity is the most important of the two elements of relationship attributes.

### 3.2.2 Technology transfer

Results of the study suggest that the technology transfer is significantly related to receptivity, in terms of knowledge transferring activities, and usage advantage in the multiple regression analysis. Technology transfer is significantly related to receptivity, in terms of knowledge transferring activities, and partner complementarity in the multiple regression analysis. Technology transfer is significantly related to receptivity, in terms of firm's resource strength and knowledge transferring activities, trust, and usage advantage in the LISREL's path analysis. It is found that, receptivity; trust, partner complementarity, trialability and usage advantage positively related to technology transfer as hypothesized. Otherwise, ownership structures are not significant to technology transfer.

The multiple regression analysis suggests that knowledge transferring activities play the most important role in influencing the local firms' learning form their partners in international alliances. The difference of the

mean values between the respondents who have a low level of knowledge transferring activities and those with a high level of knowledge transferring activities is stronger than that of other variables. This implies that the local firms should conduct training course activities more frequently because the more frequently the local firms conduct these activities, the higher the likelihood that learning will take place and will effect an improvement in technology transfer.

Cultural similarity does not have much role in the technology transfer although their relationships with the technology transfer are significant. These results found that Thai respondents did not believe that cultures between partners had to be perfectly similar in order for an alliance to be successful. Rather, cultural differences are manageable when trust between partners is high. From interview survey, it is also found that the local firms had high trust in their Japanese partners, in particular, in the foreign firm's capability and competency. In the mean time, cultural similarity is not significant for technology transfer. Therefore, the finding complements the previous study that Thai executives do not believe much in the value of cultural similarity in order to develop technological change. However. This study, the Thai respondents present low cultural similarity to their Japanese partners. Although the relationship between cultural similarity and the technology transfer is low, the direction is positive as hypothesized.

This study implies that the local firms do not participate in the trial stage before assimilating their partner's technology into their production process. The result on the significant relationship between usage advantage and the improvement of technology transfer implies that the local firms in Thailand only evaluate the technology of their partner without adopting it. This is not surprising because the supporting industry selected in this study, which are automotive parts, and electrical and electronic parts industries. These two industries are characterized as high technology-intensive (TDRI, 1992)<sup>6</sup>. the local firms cannot afford the adoption process due to the constraint financial

6 Thailand Development Research Institution (TDRI). 1992. "Master plan for industrial development of

Thailand". (unpublished). pp 15-20

resource and the scarcity of qualified human resources. Therefore, it is plausible that trialability might seem not important in technology transfer. Moreover, local Thai firms highly trust that their Japanese partner is responsible, capable, competent, enthusiasm and have leadership. The positive relationship between trust and technology transfer indicates that the local firms believe that the assimilation or the utilization of their partner's technology will certainly not undermine them. The local firms trust and rely on Japanese partner showing that they consider technology of their Japanese partner as undoubtedly useful and will receive an appropriate technology from their partner.

The significance of usage advantage indicates that local firms consider the creditability, efficiency, and cost and benefit of the technology implementation more than creating a foundation for new knowledge.

Hence, it is not easy for the local firms to assimilate or utilize their partner's technology into their own production process. This result in low understanding of how technology works and how to utilize that technology effectively of the local firm.

### 3.2.3 Human resources development

Results of the study suggest that human resources development is significantly related to trust and usage advantage in the multiple regression analysis. Moreover, human resources development is also significantly related to receptivity in terms of knowledge transferring activities in the multiple regression analysis. Thus, it is found that receptivity, trust, and usage advantage positively related to human resources development as hypothesized.

These results imply that the partner attributes and the knowledge attributes play important roles in the human resources development of the local firms. The relationship attributes (except ownership structure)

partly play a role in the human resources development.

It is plausible to argue statistically that cultural similarity is redundant when trust is in the model. Therefore, cultural similarity may not relate very significantly to the human resources development since trust, which is stronger, is employed.

Trialability also plays a roles in human resources development. Incorporating these results with those of technological change, it can be assumed that the local firms have low human resource development because they did not concentrate on increasing the function of knowledge and intellectual capital rather than traditional capital and labor.

In this study, it is found that human resources development can substantially influence how firms can manage human capital to improve their productivity. Human resources development activities encourage the learning process and create organizational learning. However, during the time of this study, the external labor market in Thailand was volatile with a chronic shortage of skilled workers. In addition, the skill requirements and training in international alliance firms in the supporting industry tended to be knowledge-intensive industry because the electrical and electronic parts industry and the automotive parts industry are the skill-based industries.

Therefore, the greatest human resource management problem facing the Thai and Japanese alliance firms were the attitudes of the Thai employees. There was a high turnover of employees and a severe shortage of qualified engineers and technicians. High turnover rates made it more difficult for all companies to invest in human resources; hence, most alliance firms had to recruit experienced applicants from the external labor market rather than set up extensive internal training programs, and most of investment in training was designed to retrain skilled workers<sup>7</sup>.

7 From interviews, although the production workers stated that they could not use the skill acquired from the companies elsewhere, they actually could use their skills in other companies in the same industry. Most respondents who had work experience came from the same industry. The reasons were that the working environment in this industry was considered to be better than other industries such as textile, foodstuff, etc.,

industries and the compensation in the electronics and electrical parts and automotive parts industries were higher as well. Engineers and technicians also moved from one company to another within the same industry, or to other consumer electronics or electrical appliances and automotive vehicles industries. Managers tended to move in the same fashion, while those in general administration could find other jobs.



The more firms invested in training them, the more likely it was that they would be enticed by other smaller multinationals or local companies that could offer higher salaries or attractive fringe benefits since they did not have to invest in training. The shorter the time these employees spent working in one company, the more difficult it was for the firm to recoup on their investment in training. Hence, the companies reduced the amount of training provided. The less employees were satisfied with the opportunities provide for them to learn new skills, the more likely it would be that they would look for jobs elsewhere. It became a vicious circle for the companies and their high profile employees.

The other reason given by employees in Thai and Japanese alliance firms for looking for a new job and their unwillingness to acquire new skill through job rotation was that there were no opportunities for promotion to a higher position in the company.

Japanese partners expected their employees to behave and sacrifice as part of the "family"; thus in return, the company would look after their work and family interests and compensate them fairly over a long period of time through lifetime employment. However, from the interview, it was pointed out that, *"Any Japanese management system that is costly and not tangibly beneficial to the local worker has a poor chance of being accepted by them."* There might be various reasons why Thai and Japanese alliance firms in Thailand and other Asian countries could not accept local employees to show the same degree of loyalty and commitment to the company as in Japan. First, the environment or culture that shaped and supported the Japanese practices did not exist. Secondly, local employees might have different conceptual frames of norms and values. Thirdly, the lack of desire of Japanese partners in the local firms to implement any policy of delegating their authority to local employees.

The respondents from general Thai local workers in Thai and Japanese alliance firms stated that they wanted to leave the company not only because of the promotion ceiling, but also because of the limited training provided. This problem could also be found in Thai and Japanese alliance firms in other developing countries. An interesting observation emerged on the eagerness of the Thai employees to take advantage of

formal education and training. This reflected the influence of Thai culture; Thais valued "knowledge" or formal education as a means of upward social mobility. Thus, they were willing to invest in formal education even though their company or they did not directly benefit much from that qualification. This attitude created the illusion of a close link between training and promotion. Training received from the company was inevitably linked with the expectation of future promotion. If promotion failed to materialize, the respondents always looked for a new job. Most Japanese partners blamed the local employees for not being loyal to the company and Thai partners blamed the company for not investing enough in the workforce and being unwilling to promote them.

This study tried to identify how human resources development occurred in Thai and Japanese alliance firms. The critical point throughout this notion is that the technology is not transferred by itself. The training of indigenous manpower can be viewed metaphorically as a winch used to transfer industrial technology. It is clear then that human resources are the most crucial factor in determining the success of technology absorption. The focal point of this study is the organization of manpower training. These activities are the training of local firms' staff in order to improve capability or productivity of their employees.

Language, understanding of cultures and interpersonal skills are important factors for access to international markets. In order to increase the efficiency and capability of alliance firms in the international arena, it is essential to improve methods of human resources development and to find new concepts to help more international alliance between Thai and Japanese firms enter the world market.

In particular, the alliances in developing countries need to improve the efficiency and capability of their human resources in the face of tougher competition and for international alliances. In this sense, there might be a need for a promotion program from the government.

### 3.2.4 Production efficiency improvement

The multiple regression analysis indicates that



local employee's job satisfaction is negatively related to local employee's production efficiency improvement. Whereas the Japanese employee's job suggestion and technology transfer is positively related to local employee's production efficiency improvement. Results of the study suggest that the Japanese employee's job suggestion and technology transfer is significant to local employee's production efficiency improvement. It is found that the local employee's production efficiency improvement is also significantly related to the intention of in terms of Japanese partner's knowledge transferring activities in the alliance firms. It is found that Japanese employee's job suggestion and technology transfer related to production efficiency improvement as hypothesized.

Local employee's job satisfaction has no significant relationship at all with the production efficiency improvement. These results implied that the local employee's job satisfaction plays no important roles in the production efficiency improvement of the local firms. It is plausible to argue statistically that local employee's job satisfaction is redundant when Japanese employee's job suggestion and technology transfer is in the model. Therefore, local employee's job satisfaction may not relate significantly to the production efficiency improvement since Japanese employee's job suggestion and technology transfer, which is stronger, is employed.

The discussion of the result from the local employee attitudes survey can be supported by the interview survey of Thai executives. The respondents posited that among international alliance firms, Japanese partner firms were the most ethnocentric in their staffing policies. There were problems in promoting local employees access to higher levels of management. The results of the survey showed that Japanese partner firms had a high ratio of expatriates to local employees.

These findings suggested that the respondents reacted or perceived employment practices not only according to their personal characteristics but also according to differences in how the company treated them and how they saw their career opportunities. The job satisfaction does not involve centrally to the working life of Thai employees. Lifetime employment

and loyalty to one company rarely existed in local Thai employees. Thus, these factors affected the high employee turnover rate. In conclusion, local employee's job satisfaction was not the significant factor positively influencing the improvement in production efficiency, which in return, negatively effects the improvement in production efficiency when these employees move to other companies. As a result, international alliances between Thai and Japanese firms in Thailand have to recruit new untrained or non-skill worker who have lower production efficiency in present jobs.

## References

- Argyris, C. 1990. *Overcoming organizational defenses: Facilitating organizational Learning*. Englewood Cliffs: Prentice-Hall: 35-70
- Argyris, C., and D.A. Schön. 1978. *Organization learning : A theory of action perspective*. Reading, MA: Addison-Wesley Publishing:
- Badaracco, J.L., Jr. 1991. *The knowledge link : How firms compete through strategic alliances*. Boston : Harvard Business School Press.
- Bower, G.H., and E.R. Hilgard. 1981. *Theories of learning*. Englewood Cliffs, NJ: Prentice-Hall.
- Buckley, P.J., and M. Casson. 1988. A theory of cooperation in international business In F.J. Contractor and P. Lorange (eds.), *Cooperative strategies in International business: Joint ventures and technology partnerships between Firms*, 31-53. Lexington, MA: Lexington Books.
- Carmines, E.G., and R. A. Zeller. 1982. *Reliability and validity assessment*. Beverly Hills, CA: Sage Publications.
- Ciborra, C. 1991. *Alliances as learning experiences: Competition and change in high - Tech industries*. In L. Mytelka (ed.), *Strategic partnerships and the world Economy*, 51-77. London: Pinter.
- Cullen, J.B., J.L. Johnson, and T. Sakano. 1995. *Japanese and local partner Commitment to IJVs: Psychological consequences of outcomes and Investments in th IJV relationship*. Journal of International Business Studies 26 (1) : 91-116.

- Daft, R., and G. Huber. 1987. How organizations learn. A communication framework. *Research in the Sociology of Organizations* 5: 1-36
- Dunning, J.H. 1997. *Alliance capitalism and global business*. London: Routledge.
- Erez,M.,and P.C. Earley. 1993. *Culture, Self-identity, and work*. New York.: Oxford University Press.
- Fiol, C., and M.Lyles 1985. *Organizational learning*. *Academy of Management Review* 10 (4) 803-813
- Geringer, J.M. 1988a. *Joint venture partner selection: Strategies for developed Countries*. Westport, CT: Quorum Books.
- Gruber, W.H., and D.G. Marquis. 1969. *Factors is the transfer of technology*. Cambridge: MIT Press.
- Hamel, G. 1990 *Competitive collaboration: Learning, power and dependence in International strategic alliances*. Doctoral dissertation, The University of Michigan.
- Harrigan, K.R. 1988b. Joint ventures and competitive strategy. *Strategic Management Journal* 9 (2): 141-158.
- Hodgson, G.1988. *Economics and Institutions*, 35-51. Blackwell,Cambridge: Polity Press.
- Inkpen, A. 1995. *The management of international joint ventures: An organizational learning perspective*. London: Routledge Press.
- Johnson, J. L., J. B. Cullen, T. Sakano, and H. Takenouchi. 1997. Setting the stage for trust and strategic integration in Japanese-U.S. *cooperative alliances*. In P. W. Beamish, and J. P. Killing (eds.), *Cooperative strategies: North American perspectives*, 227-254. San Francisco: The New Lexington Press.
- Killing, J. P. 1994. The design and management of international joint ventures. In P. W. Beamish, J. P. Killing, D. J. Lecraw, and A. J. Morrison (eds.), *International Management*. Boston: Irwin.
- Kim, D. H. 1993. The link between individual and organizational learning. *Sloan Management Review* (Fall): 37-50.
- Kogut, B., and H. Singh. 1988. The effect of national culture on the choice of entry mode. *Journal of International Business Studies* 19(3): 411-432.
- Levinson, N. S., and M. Asahi. 1995. Cross-national alliances and interorganizational learning. *Organizational Dynamics* 24(2): 50-63.
- Levitt, B., and March, J. G. 1996. In M. D. Cohen and L. S. Sproull (eds.), *Organizational learning*. Thousand Oaks, CA: Sage.
- Lorange, P., and J. Roos. 1992. *Strategic alliances: Formation, implementation and evolution*. Oxford: Blackwell.
- March, J. G. 1991. Exploration and Exploitation in Organizational learning. *Organization Science* 2(1): 71-87.
- Morrison, M., and L. Mezentseff. 1997. Learning alliances ≡ a new dimension of strategic alliances. *Management Decision* 35(5-6): 351-357.
- Nonaka, I. And H. Takeuchi. 1995. *The knowledge-creating company*. Oxford: Oxford University Press.
- Parkhe, A. 1997. Interfirm diversity, organizational learning, and longevity in global strategic alliances. In H. Vernon-Wortzel and L. H. Wortzel (eds.), *Strategic management in global economy*, 276-290. NY: John Wiley & Sons.
- Penrose, E.1959,1995. *The Theory of the Growth of the firm*, 9-41. Oxford: Blackwell.
- Porter, M. E. 1985. *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- Pucik, V. 1988. Strategic alliances, organizational learning, and competitive advantage: The HRM agenda. *Human Resource Managemnet* 27(1): 77-93.
- Root, F. R. 1988. Some taxonomies of international cooperative arrangements. In F. J. Contractor, and P. Lorange (eds.), *Cooperative strategies in international business: Joint ventures and technology partnerships between firms*, 69-80. Lexington, MA: Lexington Books.
- Rugman, A. M. 1981. Internalization and nonequity forms of international involvement. In A. M. Rugman (ed.). *New theories of the multinational enterprise*. New Youk: St. Martin's Press.
- Schumpeter, J. A. 1934. *The theory of economic development, an inquiry into profits, capital, credit, interest and the business cycle*. Cambridge MA: Harvard University Press.

- Simonin, B. L. 1991. *Transfer of knowledge of international strategic alliances: A structural approach*. Doctoral dissertation, The University of Michigan, Ann Arbor.
- Stata, R. 1989. Organizational learning-The key to management innovation. *Sloan Management Review* 30(3): 63-74.
- Teece, D. J. 1998. Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California Management Review* 40(3): 55-79.
- Thailand Development Research Institute Foundation. 1992. *Guidelines for the promotion of production and selling of intermediate products for the linkage to and the support of the export-oriented production of ready-made products* (in Thai). Bangkok.
- Thailand Development Research Institution. 1997. *Master plan for industrial development of Thailand* (unpublished).
- Vernon, R. 1966. International investment and international trade in the product life cycle. *Quarterly Journal of Economics* 80: 190-207.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal* 5(2): 171-180.
- Williamson, O. 1985. *The economic institutions of capitalism: Firms, markets, relational contracting*. New York: The Free Press.
- Winter, S. G. 1987. Knowledge and competence as strategic assets. In D. J. Teece(ed.), *The competitive challenge: Strategies for industrial innovation and renewal* 159-184. Cambridge, MA: Ballinger Publishing.
- Yamaguchi, T. 1994. Research finding report: Cross cultural technology transfer in Taiwan and Thailand from the view point of the technology supplier. In Proceedings (APFC-HRD-BMN Project). *The workshop on impact of cultural difference on cross cultural technology transfer*. China Productivity Center.
- Zand, D. E. 1972. Trust and managerial problem solving. *Administrative Science Quarterly* 17: 229-239.
- Zander, U. 1991. *Exploiting a technological edge: Voluntary and involuntary dissemination of technology*. Stockholm: Institute of International Business