SUCCESS FACTORS OF TECHNOLOGY TRANSFER PROCESS OF ENTREPRENEURIAL FOOD SMES IN THAILAND

Kamol Panmaung, Chulalongkorn University
Rath Pichyangura, Chulalongkorn University
Pakpachong Vadhanasindhu, Chulalongkorn University

ABSTRACT

Technology transfer is one of the tools to enhance the productivity and efficiency of businesses, thus increases competitiveness. SMEs regularly rely on external sources of technical and technological assistance. This study aims to explore factors and indicators that affect the success of technology transfer projects in Thai's SMEs. From literatures, the External factor, the Strategic and Management factor, the R&D factor, the Technological and Manufacturing factor, the Marketing factor, and the Human Resource factor were outlined. Questionnaires were distributed, and results showed positive consensus on all factors. The results also revealed new factors that were never been mentioned in previous literatures such as; an ability to find the right solution for marketing needs, an ability to understand scientific and technical elements in actual patents, and an ability to translate patent's technical data to actual production. An exploratory factor analysis clustered 8 groups of significant factors. This study provided better understanding of innovative entrepreneurial SMEs and contributed to the development of technology transfer process.

Keywords: Technology Transfer, Technology Transfer Success Factors, Food SMEs, Entrepreneurial SMEs.

INTRODUCTION

Thailand's economic development models have evolved from agriculture-based to light industry, and to advanced industry respectively (NESDB, 2011, 2016). As a result of these developments, Thailand is currently experiencing several economic challenges such as "*A Middle-Income Trap*", "*An Inequality Trap*", and "*An Imbalanced Trap*" (NESDB, 2016). In order to overcome those economic challenges, a new economic development model, aimed to create a value-based economy that is moved by innovation, technology and creativity, has been launched. The goal is to increase the revenue and contribution of SMEs from 37% of total GDP to 50% of national GDP within 10 years (Ministry of Industry, 2016). This economic development model is believed to stimulate new economic growth through the shift from "*Comparative Advantage*" to "*Competitive Advantage*".

To compete in the market, Small and medium-sized enterprises (SMEs) need to be sophisticated in terms of knowledge, skills, and resources. Collaboration enables smaller firms to acquire external knowledge and resources from many sources (Spithoven & Knockaert, 2012; O'Reilly & Cunningham, 2017). Collaborative R&D is seen as an important driver of firms' innovation performance (Belderbos et al., 2004, 2015). Shane (2002) categorized university-entrepreneurial firm collaboration into 4 dimensions: (1) contract research, (2) consulting, (3) technology licensing, and (4) technology development and commercialization.

According to Thailand's National Science and Technology Development Agency (2018), in 2017, 255 pieces of research were licensed from NSTDA. But those collaborated and licensed researches accounted for 4% of the total revenue. The number implies that the technology transferred could not fully turn into a profitable product. To achieve better technology transfer outcome, the gap between the transfer agent and the transfer recipient needed to be filled. Reviews of previous researches suggest several factors that affect the technology transfer process. These factors include influence from external institutes, firms' strategy and management factors, research and development factors, technological and manufacturing factors, marketing factors, and human resources factors.

Purpose

The research proposes to investigate and identify factors and indicators that influence the success of technology transfer projects from the government research institutes to SMEs in the food industry in Thailand as regarded by the recipients. As a result, the underlying indicators shall be revealed and highlighted.

LITERATURE REVIEW

In order to conceptualize the structure of this study, the literature in Entrepreneurial and SMEs Development, Technology Transfer, and Knowledge Management are thoroughly reviewed as follows;

Entrepreneurial Development

Small and medium-sized enterprises (SMEs) encounter unique research and innovation challenges. The insufficiency of essential resources (including technological expertise, financial, infrastructure, and human resources) restricts the innovation capability of SMEs (Spithoven & Knockaert, 2012; Love & Roper, 2015). O'Reilly & Cunningham (2017) suggest that SMEs may acquire access to the resource essential for innovation.

There are various approaches for entrepreneurs and SMEs to obtain knowledge and technology from external sources; cooperation with universities is considered a proper option (Belderbos et al., 2004, 2015). Shane (2002) studies and categorizes the collaborations between universities and firms into (1) contract research, (2) consulting, (3) technology licensing, and (4) technology development.

External Influence on Firms' Technology Competency

In previous studies, several external factors were proved to be influential in developing firms' technological capabilities (Panda & Ramanathan, 1996; Hemmert, 2004.)

The role of intermediaries and other support units was critical in the technology transfer process and in developing innovation capabilities of SMEs (Bessant & Rush, 1995; Rogers et al., 2001; Liu et al., 2013). Intermediaries or mediators play an important role in knowledge and technology transfer process by linking main participants together (EU, 2016).

Strategy and Management

Technology performance of firms are directly affected by organizational factors such as firm's policy and strategy, firm's structure, executive's commitment, organization culture, and organization size (Premkumar & Ramamurthy, 1995; Panda & Ramanathan, 1996; Bozeman, 2000; Cohen, 2004.)

Leadership and the past entrepreneurial experiences of executives can define the performance of SMEs (Park et al., 2017; Mishra et al., 2018.) Learning and communication factors were also reported to be influential on organization's capability to acquire technology (Premkumar & Ramamurthy, 1995; Rogers et al., 2001; Takata, 2011; Markarian, 2016).

Various studies pointed out that organizations' technology readiness and performance is directly influenced by firms' ability to acquire and assimilate knowledge (Galy, 2003; Ford et al., 2012; Cooper & Molla, 2014).

Research and Development

Research and Development resources are critical to the success of technological innovation projects (Rogers et al., 2001; Spithoven & Knockaert, 2012; Matzmorr, 2016). Firms need to have sufficient R&D expenditure and adequate internal resources in order to complete the technology transfer project (Hemmert, 2004; Hu et al., 2005; Okamuro et al., 2011.)

Firms' R&D intensity and innovativeness are also confirmed to be an important success factor by several studies (Autio & Laamanen, 1995; Hu et al., 2005; Wang et al., 2008; Maietta, 2015). Additionally, educated and experienced R&D personnel are proved to be significant in the technology transfer process (Rogers et al., 2001; Hemmert, 2004; Matzmorr, 2016).

Technology and Manufacturing

Manufacturing capabilities are acknowledged to be a crucial part of firms' technological development (Guan & Ma, 2003; Yam et al., 2004). Parasuraman (2000) propose that the recipient should have the ability to cope with complications and issues from adopting new technology.

The transfer process will be more likely to be successful should technology provider and recipient should possess some harmony in terms of knowledge and expertise (Hamel, 1991; Nonaka & Takeuchi, 1995; Inkpen & Dinur, 1998). Cummings & Teng (2003) also identified "*Knowledge Distance*" as a significant factor for the technological knowledge transfer process.

Firms' capability to effectively manage cross-functional projects also regarded as an important success factor for R&D knowledge transferring (Cumming & Teng, 2003; Matzmorr, 2016). Additionally, research by Wang et al. (2008) suggests that product cycle time and product delivery time directly impact firms' technology innovative capability.

Marketing

Marketing capabilities are vital for the success of the technology transfer process (Wang et al., 2008.) Bozeman (2000) and Wang et al. (2008) mention the firm's ability to foresight and satisfy market needs by utilizing technology as an important attribute. Firm's capability to develop a competitive new product in the marketplace is critical for a firm to turn technology into profitable commercial goods (Wang et al., 2008).

Moreover, market attractiveness altogether with suitability of marketing channel is essential for the commercialization of new technology product (Heslop et al., 2001).

Human Resources

Prior studies have indicated that human resources are the key element for technology or knowledge transfer (Lehman et al., 2002). Primary human resource aspects include staff

attributes, staff motivation, willingness to use technology (Lehman et al., 2002; Richey et al., 2007).

Parasuraman (2000) also determines people's desire or hesitation to adopt and utilise new technology as a critical factor that affects firms' technology readiness. Van der Heiden et al. (2015) stresses that employees' education level and training on related technology issues directly affect technology transfer.

METHODOLOGY

The nature of this research is quantitative. A questionnaire was developed based on variables derived from literature reviews and from the interviews with prominent food SMEs. The participants, ranged from materials supplier to a processed food manufacturer, were purposively picked from directories of food companies in Thailand. The directories were obtained from The Federation of Thai Industries (FTI), Thailand's National Food Institute (NFI), National Science and Technology Development Agency (NSTDA), and Thailand Institute of Scientific and Technological Research (TISTR). All selected SMEs have production activities and have recently transferred the technology from government research institutes. The respondents are in a position that managed or directly involved in the technology transfer process.

The questionnaires were sent to the targeted participants via post. Of 500 sets of questionnaires delivered, 168 sets of completed questionnaires were sent back. The exploratory factor analysis was conducted to identify the factor structure of variables and subsequently help illustrate practical application towards improving the SMEs technology transfer.

DATA ANALYSIS AND DISCUSSION

The data from returned questionnaires were examined using SPSS version 22 as shown in Tables 1-8. The exploratory factor analysis clusters variables associated to the success of technology transfer in SMEs into 8 factors as follows: Marketing Capabilities, Organization's R&D Capabilities, Organizational Arrangement, Project Management, Human Resource Management, Technology Business Capabilities, Human Resource Development, and Organizational Characteristics. Factor loading of those variables are ranged from 0.416 to 0.848, reflected significant contribution to the factors.

Marketing capability factor: Consists of organization's capabilities to test market, to successfully develop marketing strategy, to communicate effectively, to develop new product, and to accustom manufacturing process to new requirements (factor loading 0.793, 0.776, 0.774, 0.632, and 0.544 respectively). Result shows that all marketing related variables were perceived to be highly associated with technology transfer success. Capability to develop new product were the most important marketing capability factor, as shown in Table 1.

Table 1
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: MARKETING CAPABILITIES

Marketing Capabilities	$\bar{x}$	S.D.	Meaning of Score
Capabilities to develop new product	4.04	0.86	Very High
Capabilities to communicate effectively	3.89	0.91	High
Capabilities to accustom existing manufacturing process to new production requirements	3.82	0.97	High
Capabilities to successfully develop marketing strategy	3.8	0.93	High
Capabilities to test market	3.73	0.99	High

Organization's R&D capability factor: involves firm's R&D resources, R&D intensiveness, cooperation between R&D department and other departments, R&D innovativeness, and an ability to select suitable technology (factor loading 0.824, 0.759, 0.757, 0.736, and 0.517 respectively.) As shown in Table 2, the cooperation between departments and R&D resources were recognized as important technology transfer elements, while R&D activities were of less importance.

Table 2
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: ORGANIZATIONAL R&D CAPABILITIES

Organizational R&D Capabilities	$\bar{x}$	S.D.	Meaning of Score
Cooperation between R&D department and other departments	3.71	1.17	High
R&D resources	3.68	1.11	High
An ability to select suitable technology	3.65	1.02	High
Firm's R&D intensiveness	3.46	1.13	Medium
Firm's R&D innovativeness	3.45	1.06	Medium

Organizational arrangement factor: Includes management's commitment to the project, firm's innovation policy, organization's culture toward changes, business and marketing direction from executives, and intellectual property approach (factor loading 0.804, 0.781, 0.776, 0.760, and 0.431 respectively). As shown in Table 3, most SMEs agreed that organizational arrangement elements were associated with technology transfer process very highly, with commitment and direction from the management being highest (4.22 and 4.18).

Table 3
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: ORGANIZATIONAL ARRANGEMENT

Organizational Arrangement	$\bar{x}$	S.D.	Meaning of Score
Business and marketing direction from executives	4.22	0.87	Very High
Management's commitment to the project	4.18	0.98	Very High
Firm's policy regarding innovation	4.04	0.95	Very High
Organization's culture toward changes	4.01	0.99	Very High
Intellectual property approach	3.84	1.00	High

Project management factor: comprises firm's manufacturing timeframe, an ability to manage project's resources, an ability to plan technology transfer project, and an ability to manage project's risk (factor loading 0.657, 0.586, 0.520, and 0.499 respectively). As shown in Table 4, manufacturing timeframe was regarded as the most important element. However, the elements of project management were viewed as less critical aspects of technology transfer.

Table 4
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: PROJECT MANAGEMENT

Project Management	$\bar{x}$	S.D.	Meaning of Score
Firm's manufacturing timeframe	3.61	1.00	High
An ability to manage project's resources	3.58	0.95	Medium
An ability to manage project's risk	3.55	1.01	Medium
An ability to plan and execute technology transfer project	3.53	0.92	Medium

Human resource management factor: Includes staff's motivation, relationship between departments in organization, change management, and firm's internal

communication (factor loading 0.676, 0.636, 0.604, and 0.505 respectively). Change management was regarded by most SMEs as the most important element, while other elements were also ranked highly, as shown in Table 5.

Table 5
Mean, Standard Deviation, and Level of Technology Transfer Elements: Human Resource Management

Human Resource Management	$\bar{x}$	S.D.	Meaning of Score
Management of change	3.80	0.92	High
Staff's motivation	3.67	0.97	High
Firm's internal communication	3.66	1.01	High
Relationship between departments in organization	3.64	0.94	High

Technology business capability factor: Includes an ability to assess technology's business potential, an ability to manage internal resources effectively, an ability to match market needs with existing technology, an ability to identify market opportunity from scientific research, and an ability to source needed knowledge (factor loading 0.511, 0.503, 0.486, 0.441, and 0.416 respectively). Capability to execute scientific and technological business was an important factor. Technology sourcing, technology matching and technology assessment ability were ranked highly, as shown in Table 6.

Table 6
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: TECHNOLOGY BUSINESS CAPABILITIES

Technology Business Capabilities	$\bar{x}$	S.D.	Meaning of Score
An ability to source critical knowledge	3.68	1.12	High
An ability to match market needs with existing technology	3.67	1.10	High
An ability to assess technology's business potential,	3.62	1.04	High
An ability to manage internal resources effectively	3.59	1.08	Medium
An ability to identify market opportunity from scientific research	3.55	1.14	Medium

Human resource development factor: Consists of skill and experience of related staffs, staffs' education, and an appropriate training program (factor loading 0.651, 0.538, and 0.526 respectively). As shown in Table 7, all human resource development elements were considered to be highly associated with technology transfer performance.

Table 7
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: HUMAN RESOURCE DEVELOPMENT

Human Resource Development	$\bar{x}$	S.D.	Meaning of Score
An appropriate training program	3.79	0.96	High
Skill and experience of related staffs	3.77	0.94	High
Staffs' education	3.61	0.97	High

Organizational characteristic factor: Consists of firm's strategy for technology transfer, firm's openness, and organization structure and administration for technology-related project (factor loading 0.848, 0.791, and 0.768 respectively). The result, as shown in Table 8, indicated that most SMEs scored openness very highly as an critical part for technology transfer, while viewed strategy, organization structure and administration issues as less important elements.

Table 8
MEAN, STANDARD DEVIATION, AND LEVEL OF TECHNOLOGY TRANSFER ELEMENTS: ORGANIZATIONAL CHARACTERISTICS

Organizational Characteristics	$\bar{x}$	S.D.	Meaning of Score
Firm's openness	3.82	0.96	Very High
Firm's strategy for technology transfer	3.63	1.00	High
Organization structure and administration for technology-related project	3.54	1.04	Medium

While a result has highlighted marketing capability factor, organizational arrangement factor and human resource factors as critical success factors, this study also pointed out the areas whereas the awareness should be raised. Most SMEs seemed to put less focus on being competent in scientific knowledge and technical understanding, as well as the areas of technology project management and technology-based marketing.

In order to better conceptualize the association of these factors in technology transfer process, we propose arranging these factors into 4 main business functions as followed; Organization, Business, Marketing, and R&D and Manufacturing (Figure 1.) Organization function includes organizational characteristic factor, organizational arrangement factor, human resource management factor, and human resource development factor. Business function consists of technology business capability factor. Marketing function contains marketing capability factor. R&D and Manufacturing function is made up of organization's R&D capability factor and project management factor.

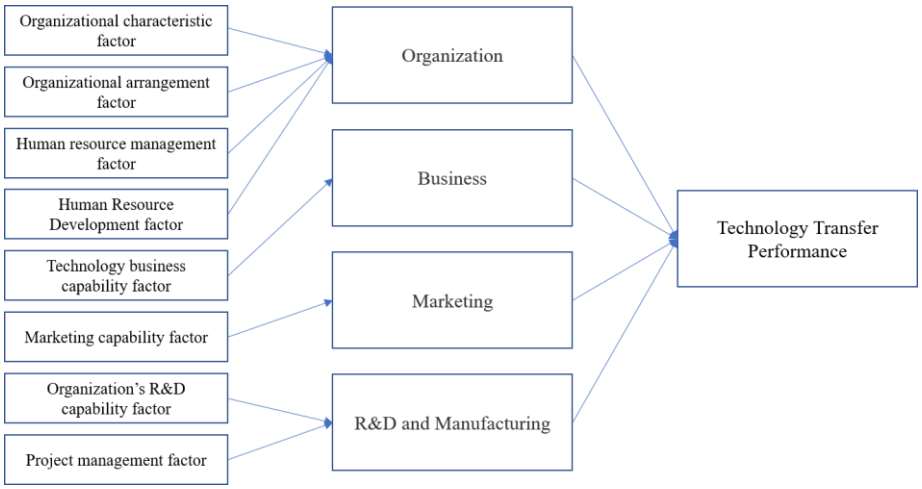

FIGURE 1
FACTORS AFFECTING TECHNOLOGY TRANSFER PERFORMANCE FOR ENTREPRENEURIAL FOOD SMES IN THAILAND.

CONCLUSION

This research summarizes entrepreneurial SMEs' opinions and perception towards factors influencing technology transfer process in Thailand. The exploratory factor analysis has categorized all affecting variables into 8 factors. These factors were then assembled into 4 main groups; Organization, Business, Marketing, and R&D and Manufacturing. This research also reveals new factors that were not mentioned before in the previous studies; an ability to find and select suitable technology for marketing needs, an ability to technically understand patents, and an ability to communicate new product value to the audience.

This research also provides better understanding of the technology transfer process in Thailand. The results highlighted entrepreneurial SME's needs; such as an accessible technology and knowledge database, a practical technology sourcing, and an effective technology matching, and gaps; such as an application of new technology in existing environment, and an appropriate qualification of related personnel. These findings will be useful for policy makers in allocating valuable resources more effectively. The operational agencies, including SME Bank and NSTDA, can also utilize this information to prepare more efficient entrepreneurial development programs and formulate dedicated technology and innovation boosting strategy for specific industry.

REFERENCES

Autio, E., & Laamanen, T. (1995). Measurement and evaluation of technology transfer: review of technology transfer mechanisms and indicators. *International Journal of Technology Management*, *10*(7-8), 643-664.

Belderbos, R., Carree, M., & Lokshin, B. (2004). Cooperative R&D and firm performance. *Research policy*, *33*(10), 1477-1492.

Belderbos, R., Carree, M., Lokshin, B., & Sastre, J. F. (2015). Inter-temporal patterns of R&D collaboration and innovative performance. *The Journal of Technology Transfer*, *40*(1), 123-137.

Bessant, J., & Rush, H. (1995). Building bridges for innovation: the role of consultants in technology transfer. *Research policy*, *24*(1), 97-114.

Bozeman, B. (2000). Technology transfer and public policy: A review of research and theory. *Research Policy*, *29*(4), 627-655.

Cohen, W. M. (2004). Patents and Appropriation: Concerns and Evidence1. *The Journal of Technology Transfer*, *30*(1-2), 57-71.

Cooper, V.A., & Molla, A. (2014). Absorptive capacity and contextual factors that influence green IT assimilation. *Australasian Journal of Information Systems*, *18*(3).

Cummings, J.L., & Teng, B.S. (2003). Transferring R&D knowledge: the key factors affecting knowledge transfer success. *Journal of Engineering and technology management*, *20*(1), 39-68.

European Union. (2016). Report on National Understanding of Transfer Processes and Reference Model of Transnational Transfer. EU.

Ford, S.J., Mortara, L., & Probert, D.R. (2012). Disentangling the complexity of early-stage technology acquisitions. *Research-Technology Management*, *55*(3), 40-48.

Galy, E. (2003). The mediating role of organizational learning between absorptive capacity and performance in companies employing enterprise resource planning software. Doctoral dissertation, The University of Texas - Pan American.

Guan, J., & Ma, N. (2003). Innovative capability and export performance of Chinese firms. *Technovation*, *23*(9), 737-747.

Hamel, G. (1991). Competition for competence and interpreter learning within international strategic alliances. *Strategic management journal*, *12*(S1), 83-103.

Hemmert, M. (2004). The influence of institutional factors on the technology acquisition performance of high-tech firms: survey results from Germany and Japan. *Research Policy*, *33*(6), 1019-1039.

Heslop, L.A., McGregor, E., & Griffith, M. (2001). Development of a technology readiness assessment measure: The cloverleaf model of technology transfer. *The Journal of Technology Transfer*, *26*(4), 369-384.

Hu, A.G., Jefferson, G.H., & Jinchang, Q. (2005). R&D and technology transfer: firm-level evidence from Chinese industry. *Review of Economics and Statistics*, *87*(4), 780-786.

Inkpen, A.C., & Dinur, A. (1998). Knowledge management processes and international joint ventures. *Organization Science*, *9*(4), 454-468.

Lehman, W.E., Greener, J.M., & Simpson, D.D. (2002). Assessing organizational readiness for change. *Journal of substance abuse treatment*, *22*(4), 197-209.

Liu, X., Shou, Y., & Xie, Y. (2013). The role of intermediary organizations in enhancing the innovation capability of MSMEs: evidence from a Chinese case. *Asian Journal of Technology Innovation*, *21*(sup2), 50-61.

Love, J.H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International small business journal*, *33*(1), 28-48.

Maietta, O.W. (2015). Determinants of university–firm R&D collaboration and its impact on innovation: A perspective from a low-tech industry. *Research Policy*, *44*(7), 1341-1359.

Markarian, J. (2016). Technology transfer connections: transferring the manufacturing of a drug from one scale to another or between manufacturing sites presents both technical and business challenges. *Pharmaceutical Technology*, (4). 20.

Matzmorr, W. (2016). Planning a biologics facility start up: integrating quality and compliance with technology transfer and careful project management are key in starting up a facility and launching a biologic drug. *Pharmaceutical Technology*, (7). 60.

Ministry of Industry. (2016). Strategies for Thailand's Industrial 4.0 Development (2017–2036). Bangkok. Ministry of Industry.

Mishra, G.P., Mishra, K.L., & Mishra, R. (2018). Leadership, Organizational Effectiveness and Entrepreneurship in Small and Medium Enterprises-A Study in Indian Context. *Academy of Entrepreneurship Journal*, *24*(2), 1-12.

National Economic and Social Development Board. (2011). The Eleventh National Economic and Social Development Plan (2012–2016). Bangkok. NESDB.

National Economic and Social Development Board. (2016). The Eleventh National Economic and Social Development Plan (2017–2021)". Bangkok. NESDB.

National Science and Technology Development Agency. (2017). Annual Report 2016. Bangkok. NSTDA.

Nonaka, L., Takeuchi, H., & Umemoto, K. (1996). A theory of organizational knowledge creation. *International Journal of Technology Management*, *11*(7-8), 833-845.

O'Reilly, P., & Cunningham, J. A. (2017). Enablers and barriers to university technology transfer engagements with small-and medium-sized enterprises: perspectives of Principal Investigators. *Small Enterprise Research*, *24*(3), 274-289.

Okamuro, H., Kato, M., & Honjo, Y. (2011). Determinants of R&D cooperation in Japanese start-ups. *Research Policy*, *40*(5), 728-738.

Panda, H., & Ramanathan, K. (1996). Technological capability assessment of a firm in the electricity sector. *Technovation*, *16*(10), 561-588.

Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, *2*(4), 307-320.

Park, M.S., Park, J.W., & Kim, J.H. (2017). The effect of SME CEO'S entrepreneurial experience on corporate performance. *Academy of Entrepreneurship Journal. 23*(2), 1-30

Premkumar, G., & Ramamurthy, K. (1995). The role of interorganizational and organizational factors on the decision mode for adoption of interorganizational systems. *Decision Sciences*, *26*(3), 303-336.

Richey, R.G., Daugherty, P.J., & Roath, A. S. (2007). Firm technological readiness and complementarity: capabilities impacting logistics service competency and performance. *Journal of Business Logistics*, *28*(1), 195-228.

Rogers, E.M., Takegami, S., & Yin, J. (2001). Lessons learned about technology transfer. *Technovation*, *21*(4), 253-261.

Rush, H., Bessant, J., & Hobday, M. (2007). Assessing the technological capabilities of firms: developing a policy tool. *R&D Management*, *37*(3), 221-236.

Shane, S. (2002). Executive forum: university technology transfer to entrepreneurial companies. *Journal of Business Venturing*, *17*(6), 537-552.

Spithoven, A., & Knockaert, M. (2012). Technology intermediaries in low tech sectors: the case of collective research centres in Belgium. *Innovation*, *14*(3), 375-387.

Takata, M. (2011). Study of the process of university technology commercialization: The roles and effects of educational courses. *International Journal of Engineering Innovation and Management*, *1*(1), 15-28.

Thailand Board of Investment. (2017). Thailand Investment Review, *27*(1), Bangkok, BOI.

Van der Heiden, P., Pohl, C., Mansor, S.B., & van Genderen, J. (2015). The role of education and training in absorptive capacity of international technology transfer in the aerospace sector. *Progress in Aerospace Sciences*, *76*, 42-54.

Wang, C.H., Lu, I.Y., & Chen, C.B. (2008). Evaluating firm technological innovation capability under uncertainty. *Technovation*, *28*(6), 349-363.

Yam, R.C., Guan, J.C., Pun, K.F., & Tang, E.P. (2004). An audit of technological innovation capabilities in Chinese firms: some empirical findings in Beijing, China. *Research policy*, *33*(8), 1123-1140.