Identifying the Determinants of Knowledge Transfer within University and Industry Alliance

Lina Anatan

This working paper is aimed to propose a conceptual model of university to industry knowledge transfer by identifying the determinant factors of knowledge transfer within university and industry alliance. Transaction cost economics, resource-based theory, and knowledge-based theory are used to explain the relationships between antecedents (knowledge attributes, organizational attributes, network attributes) and consequent of university to industry knowledge transfer and the role of uncertainties as moderating variable that might affect the relationship between university to industry knowledge transfer and the alliance performance. The study is expected to fill the gap in the study of university to industry knowledge transfer within university and industry alliance and to contribute the strategic management literature to support the development of intellectual capabilities and professional knowledge for researchers in the field of management through the application of theory in the industry. This study is also expected to support the efforts to develop "research partnership" between academics and practitioners. Cooperation to develop the research, information, capabilities between the two parties will be a platform for resolving the problems in the real sector of the industry so that practical solutions can be created through the formulation of appropriate policies and strategies based on real problems faced in industry.

Field of research: Management

1. Introduction

Structural changes in the era of globalization, information, and knowledge-based economy had an impact on the transformation process of a significant transfer of knowledge within organization. This condition lead to the important role of knowledge transfer performance and competitive advantage in company, as well as behind the transition role of the university that originally focused only on teaching and research, into engine of economic growth.

To implement the new role of the university, cooperation between universities and industry through strategic alliances is needed as channel of knowledge transfer from university to industry. In this alliance, the university acts as the transferor of knowledge transfer to industry, but the fact show that there is still lack of contribution in the process of knowledge transfer from university to industry. There should be government policies that govern role of higher academic activities in the industrial world.

The Government Policy through UU no 18/2002 marks as the starting points of strategy development on knowledge and technology in Indonesia. The law focused on national system of science and technology to strengthen the linkage between research, development, and application of science and technology in universities, industry, and government through research partnerships and the increasing of technology transfer activities.
In further developments, the Government issued a White Paper Research (Buku Putih Penelitian) in 2006 that discusses the development and application of science and technology during the years of 2005 to 2025. The purpose of this policy is to build self-reliance through the mastery of which supported the strengthening of science and technology in the fields of food security, renewable energy, transportation, information and communication, defense and security, health and medicine (Media Indonesia, 4 Mei 2013/ Humasristek).

To support the important role of university in the strategic alliance between university and industry, the Government established the Higher Education Act no. 12 in 2012 (UU Pendidikan Tinggi no. 12 tahun 2012). The clause number 64 stated that university has autonomy in the management of both academic and non-academic to produce the good quality of education and to reduce the commercialization on education that frequently happen. Through the autonomy, the alliance is expected to give positive impact to improve the quality of the research and to encourage research oriented so that the patent can be applied in the industry.

The process of knowledge transfer from universities to industry has few barriers in such characteristics and technological knowledge, technical skills required, different missions, and cultural differences. A systematic understanding in the management of intellectual property in knowledge transfer activities through universities and industry alliances, particularly in in Indonesia is still very low, resulting in low level of cooperation of universities and industry in Indonesia.

The identification of the determinants of university and industry alliance performance to facilitate knowledge transfer activities is indispensable to improve the effectiveness of knowledge transfer from university to industry, so that the interest of cooperation can be improved. This study develops a proposed integrative model of university to industry knowledge transfer to identify the determinants of university and industry alliance performance based on perspective of Transaction Cost Economy (TCE), Resource-based Theory (RBT), and the Knowledge-based Theory (KBT) to explain the relationship between variables.

Empirical studies on university and industry alliance has been widely practiced in developed countries such as America and Australia, but is still very rare research done in Asia, particularly in Indonesia, that resulting on a large gap in the study of knowledge transfer through alliances university-industry. Referring to the studies conducted by Lyles and Salk (1996); Adler and Kwon (2002); Van Wijk, Jansen, & Lyles (2008), this study classifies the antecedents of knowledge transfer into three categories: knowledge attributes, organizational attributes, and network attributes (Lyles & Salk, 1996; Szulanski, 1996). The consequent of knowledge transfer in this study is measured through the level of institutionalization of knowledge transfer activities (Santoro & Gopalakrishnan, 2000).

The research questions that will be answered in this study include: 1) Does the antecedent factors (knowledge attributes, organizational attributes, and network attributes) has significant influence on knowledge transfer in universities and industry alliances? 2) Does the transfer of knowledge has significant influence on the institutionalization of knowledge transfer. 3) Does the environmental uncertainty (uncertainty and organizational techniques) moderate the relationship between the transfer of knowledge and institutionalization of knowledge transfer?

This study is the development and synthesis of previous studies. The urgency and authenticity of the study include: Firstly, this study aims to test integrated antecedent variables, moderating variables and the dependent variable, and not fragmented as previous studies. This study also develops a proposed conceptual framework to explain the determinants of university and industry alliance performance in the process of knowledge transfer from university to industry. Secondly,
most studies of knowledge transfer in strategic alliances still ignore the role of environmental
uncertainty in explaining the effect of knowledge transfer on the alliance performance, in this study
the environmental uncertainty variable is proposed as a moderating variable that explains the
relationship between knowledge transfer and alliance performance.

Thirdly, network attributes in this study include the structural dimension, relational dimension, and
cognitive dimension. In previous studies focus more on the relational dimension, particularly in
relation to the trust factor. The existence of a significant gap in terms of the culture and mission of
both parties would be the possibility of the main reasons of trust becomes an important issue in the
formation of alliances between university and industry.

2. Literature Review

2.1 Previous Studies on University to Industry Knowledge Transfer

Agrawal (2001) categorized the literature on university to industry knowledge transfer in four
categories: Firstly, the research on the characteristics of companies that focus directly on issues
such as the company's internal organization, allocation of resources, and partnerships. Secondly,
the characteristics of universities focus more on issues related to the university strategies such as
licensing, patent incentives generated professors, and policies such as intellectual property. Thirdly,
the studies that focus on the geographical problem of localized spillover university-industry
relationships and its influence on the success of knowledge transfer. Fourthly, focus on the channel
or channels to test the importance of knowledge transfer between university knowledge transfer
path as publications, patents, and consulting. Each category is summarized in Table 1.

Tabel 1.

<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Focus of Study</th>
<th>Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Characteristic</td>
<td>Research on the characteristics of companies that focus directly on issues such as the company's internal organization, allocation of resources, and partnerships</td>
<td>Cohen dan Levinthal, 1989, 1990; Cockburn dan Henderson, 1998; Lim, 2000; Zucker et al., 2000; Shane and Stuart, 2000; Ziedonis, 1999; Audretsch, 2000.</td>
</tr>
<tr>
<td>University Characteristic</td>
<td>Issues related to the university strategies such as licensing, patent incentives generated professors, and policies such as intellectual property.</td>
<td>Henderson et al., 1998; Thursby, 2000; Feldman et al., 2000; Jensen dan Thursby, 1998; Gregorio dan Shane, 2000.</td>
</tr>
<tr>
<td>Geography in term of localized knowledge Spillover</td>
<td>Geographical problem that is localized spillover university-industry relationships and its influence on the success of knowledge transfer</td>
<td>Jaffe, 1989; Jaffe et al., 1993; Zucker et al., 1998; Audretsch dan Feldman, 1996; Zucker et al., 2000; Agarwal, 2000.</td>
</tr>
<tr>
<td>Channel of knowledge transfer</td>
<td>Knowledge transfer channels to test the importance of knowledge transfer between in university paths such as publications, patents, and consulting</td>
<td>Cohen et al., 1998; Cohen et al., 2000; Agrawal dan Henderson, 2000; Colyvas et al., 2000; Shane, 2000.</td>
</tr>
</tbody>
</table>

Source: Author’s Elaboration
The issue of knowledge creation, knowledge transfer, and learning between alliance partners has attracted the interest of researchers in academics. Strategic alliances between university and industry in this case is defined as an activity which coordinated cooperation between companies and universities involves exchange, sharing, or co-development that may include contributions of capital, technology, or specific activity of the company. The success of the development of alliances with alliance partners is used as a measure of good or bad performance of knowledge transfer, because of the relationship that is created in a strategic alliance gives legitimacy and solid position. Nielson (2005) classify the literature related to the issue of knowledge in strategic alliances as shown in Table 2.

### Table 2.

**Knowledge Transfer within Strategic Alliances**

<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Focus of Study</th>
<th>Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge as the source of competitive advantage.</td>
<td>The role of effective management of inter-firm knowledge</td>
<td>Anand dan Khanna, 2000;</td>
</tr>
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<td></td>
<td></td>
<td>Grant dan Baden-Fuller, 2002;</td>
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<tr>
<td>Knowledge (Complementary) as a liaison alliance</td>
<td>Motivation and selection of alliance partners</td>
<td>Beamish, 1984; Geringer, 1988.</td>
</tr>
<tr>
<td>Knowledge Creation</td>
<td>How to learn from alliance partners to gain access to skills and resources that are not owned by the organization. The main issues of knowledge transfer and knowledge transfer mechanisms are ambiguity and protection capabilities</td>
<td>Harrigan, 1985; Zander &amp; Kogut, 1995; Grant, 1996; Simonin, 1999; Kale et al., 2000</td>
</tr>
<tr>
<td>Knowledge Absorption</td>
<td>Internal knowledge transfer capacity. The absorption capacity is positively related to learning and considered as &quot;primary origin of knowledge stickiness&quot;</td>
<td>Cohen dan Levinthal, 1990; Szulanki, 1995; Lyes dan Sal, 1996</td>
</tr>
<tr>
<td>Collaborative Knowledge</td>
<td>Develop skills and knowledge &quot;know-how&quot; useful in the alliance in the future. Knowledge of collaboration that determine the outcome of the alliance.</td>
<td>Powell et al, 1996; Simonin, 1997; Gulati, 1998; Gupta dan Govindarajan, 2000</td>
</tr>
<tr>
<td>Knowledge as a determinant of the alliance evolution</td>
<td>How is knowledge gained through the alliance can be the center of the evolution of the alliance.</td>
<td>Doz dam Prahalad, 1998</td>
</tr>
</tbody>
</table>

Source: Nielson (2005)

These studies emphasize the importance of the attributes of the alliance partners, the motive to do the alliance, and alliance partner selection, in the quest to increase the level of selection the right alliance partners (Kale et al., 2000). Alliance attributes such as absorption capacity, competency management cooperation, accuracy and suitability of the culture, and the characteristics of the structure may influence the effectiveness of knowledge transfer in university-industry alliances (Sherwood and Covin, 2008). Heide and John (1988) suggested several antecedent factors in improving the performance associated with the selection of alliance partners in choosing the right alliance partners who have significant resources and with whom strategic and economic incentives can be associated with the extent of the alliance.
2.2 Theoretical Background

The literature shows three theoretical basis in strategic alliances that can be used as a basis to explain the theory of knowledge transfer in universities and industry alliance includes Economic Transaction Cost Theory (TCE), Resource-based View (RBV), and the Knowledge-based View (KBV). TCE is the most useful theory to integrate into economic implications of organizational behavior strategic analysis of the company (Kogut, 1988).

The theory integrates the economic impact organizational behavior in strategic analysis and emphasis on the internal use of organization as incentive cooperation and sharing of knowledge through the threat of opportunism control (Sampson, 2004). Transaction costs in the context of TCE are all covered costs and prices when setting up and implementing contracts and agreements in a collaboration (Kogut, 1988).

Williamson (1975) argued that according to TCE, humans have limited rationality and opportunism properties. It deals with the question of economic organization that focuses on the transaction as the unit of analysis and the minimum transaction costs between the various assets, including all the costs that used when preparing and implementing contracts and agreements, relating to lawsuits to stabilize labor relations and expanding investment channels.

The theory also explains all economic activities related to the exchange transaction between two or more economic agents with a mechanism of governance in accordance with the nature of the transaction to optimize the exchange (Williamson, 1985). According to TCE, organizations decided to engage in an alliance when the costs were lower than those involved in the full integration of the activities provided in the existing corporate hierarchy (Hennart, 1991)

Penrose (1959) argued that according to RBV, the organization is defined as a set of productive resources and administrative organization which is an important source of competitive advantage for companies must utilize their internal strength through control of resources. Company's competitive advantage is based more on internal corporate resources than a company's basic products (Wernefelt, 1984).

Company resources become strategic resource if they have four attributes, ie valuable, rare, not in imitation, and not in substitution to be a source of sustainable competitive advantage. Resources, assets, and capabilities can be combined and accumulated in nature. Each resource bundle that has the potential strategic and complementary rental that produces certain changes with the variation of resources is highly dependent on the ability of management.

Basic argument for the formation of alliances based RBV is that companies try to create an appropriate value in the inter-company relationships by leveraging superior resources at their disposal with complementary resources. The decision to engage in an alliance based on two important reasons that companies are in a strategic position are vulnerable and require resources from the alliance, and companies need to utilize their assets (Eisenhardt & Schoonhoven, 1996).

Company's competitive advantage is strongly influenced by various factors such as production costs, availability of capital, the quality of goods, and the technology used. To achieve competitive advantage companies need to focus on mastery-overs such matters. The main achievement of the key competitive advantage is the ability to keep up with technology and adopting existing technologies.

Competitive advantage through the development of innovative products and services and the adoption of new technologies are necessary to achieve and maintain a competitive advantage.
Companies can choose different ways to access the technology they need, for example by buying technology, but it will not provide a competitive advantage because the same technology can be accessed by all the companies if they have the financial ability to buy it.

Another approach is through the development of technologies to invest in the development of a high degree of risk. It is not surprising that the number of companies who produce the technology itself is still very low. Another alternative is to outsource from third parties and to participate in projects such as the development of technology companies and educational institutions. Outsourcing requires a clear perception of technology needs, so it can be translated into specific requirements.

The use of internal company or organization as a means to increase the flow of productive knowledge become the emphasize of KBV (Kogut & Zander, 1992). Knowledge is a firm’s most important and primary resource (Grant, 2002; McEvily & Chakravarthy, 2002), especially tacit knowledge (Polanyi, 1968) is most valuable for organizations because it is linked to individuals, very difficult to articulate, difficult to transfer and thus can give a sustainable competitive advantage. Knowledge has become a strategic resource of the most significant of the company (Grant, 1996). The company’s future growth depends on the productive integration of knowledge resources, decision-making capabilities, and competitive advantage comes from the coordination and combination of different knowledge resources at the corporate level rather than individual level through business activities.

According to KBV, the motivation of knowledge transfer behavior through the alliance is to access other firm’s resources and to enhance knowledge in certain functional areas, as the required knowledge, which refers to skills, capabilities, and process (Ireland, Hitt, & Vaidyanath, 2002, that could be critical to enhance organizational performance and competitiveness cannot be developed by a single company. The alliance brings partners to make similar contribution in case of sharing the risk of asset investment. The key concepts, links to alliance, and the advantage of TCE, RBT, and KBT summarized in Table 3.
<table>
<thead>
<tr>
<th>Theory</th>
<th>Concept</th>
<th>Link to Alliance</th>
<th>Advantage</th>
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<tbody>
<tr>
<td><strong>Transaction Cost Economics</strong></td>
<td>TCE focus on minimum transactions cost achievement among various assets (Kogut, 1988; Tallman, 2005).</td>
<td>Firms will establish alliances when the cost incurred is perceived to be lower than that involved in full integration of the given activity within the existing corporate hierarchy (Hennart, 1991).</td>
<td>According to Ding et al., 2009, there are three advantages of TCE, RBT, and KBT approach</td>
</tr>
<tr>
<td><strong>Resource-based theories</strong></td>
<td>According to RBT, resources are considered as important source of competitive advantage (Barney, 1991).</td>
<td>Through alliance, firms try to create an appropriate value in inter-firm relationships by leveraging the superior resources they possess with complementary resources.</td>
<td>1. The theories seek to develop competitive advantage for collaborating firms.</td>
</tr>
<tr>
<td><strong>Knowledge-based theories</strong></td>
<td>According to KBT, knowledge is a firm’s most important and primary resource (McEvily &amp; Chakravarthy, 2002), especially tacit knowledge (Polanyi, 1968).</td>
<td>Firm decide to engage within an alliance to access other firm’s resources and to enhance knowledge in certain functional areas, as the required knowledge cannot be developed by a single company.</td>
<td>2. The theories try to maximize long run profit through using and developing firm resources (knowledge)</td>
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<td></td>
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<td>3. The theories create opportunities for learning of knowledge by partners.</td>
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</table>

Source: Anatan (2013)

### 2.3. Hypothesis Development

The results of conceptual and empirical literature review on knowledge transfer from university to industry within university and industry alliance became the basis of the development of the research model in this study. This study classifies the antecedents of knowledge transfer into three categories: knowledge attributes, organizational attributes, and network attribute (Adler and Kwon, 2002; Lyles and Salk, 1996), and the consequent transfer of knowledge is measured by the level of institutionalization of knowledge transfer (Santoro and Gopalakrishnan, 2000), and explains the role of moderating variables which categorized environmental uncertainty in technical and organizational uncertainty.
2.3.1 Antecedent of Knowledge Transfer

2.3.1.1 Knowledge Attributes

Knowledge ambiguity is a predictor of the most important organizational knowledge (Levin and Cross, 2004; Simonin, 1990; Szulanski et al., 2004) and refers to the condition that inhibits the transfer of knowledge that provides protection knowledge so difficult to be imitated by competitors and impede the transfer of knowledge intra and inter-organizational (Coff et al., 2006). Reed and DeFillippi (1990) suggested that the ambiguity arises from the effect simultas knowledge tacitness, specificity, and complexity of fundamental knowledge in the transfer.

Simonin (1999) suggested the ambiguity of knowledge related to such things as put forward by several authors, namely: ambiguity (Crossan and Inkpen, 1995) causal ambiguity (Reed and DeFillippi, 1990), inertness knowledge (Kogut and Zander, 1992), the internal stickiness (Szulanski, 1996), and sticky information (Von Hippel, 1994).

Based on TCE perspective, knowledge ambiguity has a negative impact in decision making strategic alliances, because the decisions is made when a perceived low costs incurred. Knowledge ambiguity refers to the study of knowledge Simonin (1999) which includes tacitness, asset specificity, complexity, experience, partner protectiveness, cultural distance, and organizational distance. The overall results of empirical studies indicate that a high level of ambiguity of knowledge, not only become "imitation barrier" for competitor, but also inhibiting the activity of knowledge transfer in university and industry alliance. The following hypothesis is developed:

Hypothesis 1: Ambiguity knowledge negatively affect the knowledge transfer

2.3.1.2 Organizational Attributes

Previous studies assessing the role of size, age, decentralization and absorption capability as measure of organizational attributes that have important role as antecedent in the study of knowledge transfer (Van Wijk et al., 2008).

Organization Size

Organization size is defined as the amount of labor (Serenko et al., 2007). The results of empirical studies indicate that the effect of organizational size on knowledge transfer is positive (Dhanaraj et al., 2004; Gupta & Govindarajan, 2000), negative (Makino & Delios, 1996; Connely & Kollowey, 2003), and has no effect (Tsang, 2002), so that it is concluded the effect of firm size on the transfer of knowledge is inconclusive. Studies conducted by Connely and Kollowey (2003) showed a negative relationship between organization size and knowledge transfer resulting from a change in social interaction.

Labor in small organizations is more flexible than in large organizations, in terms of cultural adjustment, so that the greater the size of the organization will be the more difficult process of knowledge transfer. In explaining the role of organization size, RBV indicated that alliance will occur in conditions of resource interdependence between alliance partners, both tangible and intangible resources, such as knowledge and skills. Alliance used as a way to get the resources they have valuable alliance partners to improve performance and achieve competitive advantage. In this study, hypothesis is developed as follow:

Hypothesis 2a: Organizational size positively affect the knowledge transfer
Organization Age

Organization age is an important factor that determines the limits of its capacity to learn and to adapt to environmental changes. The older the organization is considered to have limited ability to learn and adapt to changing circumstances change (Cyert & March, 1963). In explaining the role of age-related organizational learning capacity of the organization, KBV viewed that the essence of an organization is the ability to create, to transfer, to integrate, and to exploit knowledge assets.

Previous empirical studies indicate that younger organizations have the advantage of learning more than the older organization (Frost et al., 2002), whereas some of the results of empirical studies show the opposite, namely that age has no effect on the transfer of knowledge (Powell et al., 1996; Gray & Meister, 2004; Yli-Renko et al., 2001).

March (1963) in Van Wijk et al. (2008) stated that the older the organization will lead to more sluggish and have limited ability to learn and to adapt to the changing environment, and the results of an empirical study of Frost et al. (2002) shows the negative influence of the organization age on knowledge transfer. Referring to Cyert and March (1963) and Frost et al., (2002), developed the following hypothesis:

Hypothesis 2b: Organization age negatively affect knowledge transfer

Decentralization

Decentralized organization synonymous with the granting of autonomy to each unit in the organization for the development and creation of knowledge within the business unit. The higher level of autonomy will be positively related to the creation and development of knowledge (Gupta & Govindarajan 1991). Jehnsen and Mechling (1992) in Christie et al., (2003) suggested that the underlying theory of decentralized decision is very simple, namely that the value increased by minimizing the total cost and the cost of knowledge transfer and knowledge transfer control in accordance with the essence of TCE that emphasizes the minimization of costs (Anatan, 2013).

Value maximization occurs when the responsible party to make the decision to have knowledge value to the decisions made. The right decision can be placed through the transfer of knowledge to the person who has the right to make a decision (a knowledge transfer fee) or transfer the decision to the person who has the knowledge (the cost of control). This study developed the following hypothesis:

Hypothesis 2c: Decentralization positively affect the knowledge transfer

Absorptive Capacity

Absorptive capacity is regard to the organization's ability to recognize, assimilate and apply new external knowledge (Cohen & Levinthal, 1990). According to KBV, absorptive capacity plays an important role in organizational learning on inter-organizational knowledge transfer process is determined by the similarity between the basic knowledge possessed alliance partners, while similarities in specific knowledge has a negative correlation with organizational learning (Lane & Lubatkin, 1998).

Results of a study conducted by Szulanski (1996) and Mowery et al. (1996) provide empirical evidence that absorptive capacity facilitates inter-organizational knowledge transfer. Absorption
capacity has a real contribution in transferring knowledge across units within the company (Gupta & Govindarajan, 2000; Lane et al., 2001), so it is generally concluded that the absorption capacity has an important role in increasing knowledge transfer both intra-organizational and inter-organizational. This study developed the following hypothesis:

Hypothesis 2d: Absorptive capacity positively affect the knowledge transfer

2.3.1.3 Network Attributes

KBV explains that knowledge as social capital, especially tacit knowledge is the most valuable factor in the organization because it is difficult to transfer, thus providing a sustainable competitive advantage. Although tacit knowledge is difficult to transfer between organizational boundaries, empirical studies prove that social capital is an important facilitator of knowledge transfer (Yli-Renko et al., 2001).

Structural Dimension

Structural dimension of social capital includes the pattern of relationships between the actors involved in the alliance from the perspective of social interaction and engagement network (Nahapiet & Ghoshal, 1998). Social interaction is concerned with how organizations maintain close personal relationships with alliance partners. Attachment associated with a specific way related to each other actors in the network. Transfer and acquisition of knowledge in an alliance is highly dependent on the level of closeness and attachment between alliance partners (Krackhardt, 1992).

The results of the study proved that the strong attachment is an effective tool in the process of knowledge transfer within and between organizations involved in strategic alliances (Hansen, 1999). Increased intensity of relationships in the network provides enhanced levels of knowledge transfer, so the hypothesis is developed as follows:

Hypothesis 3a: Structural dimensions positively affect on knowledge transfer

Relational Dimension

In this study, the relational dimension refers to the study Inkpen and Tsang (2005) which focuses on trust. Previous studies found trust between the partners has a positive influence on knowledge transfer, as the increase in the willingness and commitment of organizations partner to understand the new external knowledge (Lane et al., 2001). However, some studies indicate that a high level of confidence that can also inhibit the transfer of new external knowledge as a collective blindness (Lane et al., 2001; Yli-Renko et al., 2001), so it can be concluded that there are inconsistencies in the findings of previous studies, but in general both in the conceptual literature and in previous studies, the relational dimension is associated with an increase in the transfer of knowledge (Van Wijk, et al., 2008). The ability to obtain information from the attachment in an alliance is proportional to the confidence in the alliance. Trust is a very important factor in receiving useful knowledge from a strong attachment, therefore the hypothesis is developed as follows:

Hypothesis 3b: Relational dimensions positively affect knowledge transfer

Cognitive Dimension

Cognitive dimension in this study refers to the dimensions of Inkpen and Tsang (2005) which include shared goals and shared cultures. The shared goal is the degree to which organizational
members share a common understanding and approach to the achievement of the task and the outcome depends on the type of tissue network, tasks, and outcomes may vary.

In explaining the concept of shared goals, Inkpen and Tsang (2005) refers to the concept of shared visions that focus on efforts to achieve collective goals and aspirations of the members of the inter-organizational networks. When there are shared visions, members have the same perception of how they should interact with each other. Shared visions is help to integrate the knowledge to the alliance partners in the alliance, therefore the hypothesis is developed as follows:

Hypothesis 3c: Cognitive dimension positively affect knowledge transfer

2.3.2. Knowledge Transfer and Institutionalization of Knowledge Transfer

Organization’s ability to gain knowledge on an ongoing basis and create a competitive advantage is strongly influenced by the ability of the organization to institutionalize the process of knowledge transfer. The results of the research conducted by Santoro and Gopalakrishnan (2000) reinforce expectations to see the relationship between the company's internal context and the institutionalization of knowledge transfer. To effectively interact with the external environment and to absorb the elements of proper knowledge, companies need to perform routine activities involving knowledge institutionalization of knowledge to continue the process of knowledge transfer in a long-term period.

Hedges and Olkin (1985), Hunter and Schmidt (2004) point out the differences in the results of studies in explaining the effects of the homogeneity of the relationship between organizational knowledge transfer, and variable consequences. The difference in the results of the study indicate there are other variables that may influence the effect of homogeneity between these variables, so it is necessary the development of integrative models that examine the relationship between the antecedents of knowledge transfer, the consequent transfer of knowledge, and the moderating variable relationship between knowledge transfer and its consequences.

According to the RBV theory, business strategy manager is seen as an attempt to find the best compromise between companies with a dynamic environment and uncertain, with emphasis on factors internal to the organization. The selection of moderating variables in this study refers to the study conducted by Daghfous (2007), which examines the role of uncertainty as the moderating variable in explaining the relationship between knowledge transfer and its consequence.

Uncertainty conceptualized as a lack of knowledge about technology and its impact on the organization, at the time of the main technical objectives of a strategic alliance is determined (Daghfous, 2007). The uncertainty in this study include technical uncertainty and organizational uncertainty in the strategic alliance has a role as a moderating variable that explains the relationship between knowledge transfer and the consequent transfer of knowledge (Westphal et al., 2006; Goerzen, 2007).

Empirical studies that examine the moderating role of uncertainty in the process of knowledge transfer have been carried out (Daghfous, 2004). Song & Montoya-Weis (2001) found that technological uncertainty has a moderating influence as a significant variable in explaining the relationship between knowledge transfer and new product development projects in universities and industry alliances. Waldman et al. (2001) found that environmental uncertainty moderates the relationship between leadership characteristics and performance of the organization in the process.
of knowledge transfer through university and industry alliances. Based on the findings in this study hypothesized that:

**Hypothesis 4:** The relationship between knowledge transfer and the level of institutionalization of knowledge transfer activities is influenced by the level of uncertainty.

**Hypothesis 4a:** The relationship between the level of institutionalization of knowledge transfer and knowledge transfer activity will be stronger when there is low level of organizational uncertainty.

**Hypothesis 4a:** The relationship between the level of institutionalization of knowledge transfer and knowledge transfer activity will be stronger when there is low level of organizational uncertainty.

### 3 Research Methodology

#### 3.1 Population and Sample

The population of the study included all manufacturing and service companies operating in Indonesia. The study used a survey method to manufacturing and service companies who have committed cooperation or alliances with universities in Indonesia. Selection of the target company and the CEO of the company respondents obtained from the data of information obtained from the data collaboration university cooperation. Sampling was carried out through non-probability method, the method of purposive sampling, the method of retrieval for a population that has been determined in advance by the researcher deliberately.

#### 3.2 Technique of Data Collection

This study uses the cross-sectional data, sampling technique was performed using the technique of self-administered mail survey addressed to the CEO who is responsible for the cooperation project university-industry alliances. Distribution of the questionnaire carried out for three months with a limit of return for four weeks after receipt of the letter by the company. When the exceeded the return, researchers have not yet received the questionnaire returned, then the researcher will send a letter along with the supplementary questionnaire to the target respondents.

To improve the response, the researcher is following the suggestions put forward by Isaac and Michael (1990) by using the free system and subsequent mailing to the respondent. In addition, following the advice set out in Cooper & Schindler (2004), to maximize postal survey used Total Design Method (TDM), which emphasizes the follow-up process as follows:

1. One week after sending questionnaires - post cards of thanks will be sent to all the respondents to restore and remind respondents to fill out and submit the questionnaire.
2. Three weeks after sending the questionnaire - a new questionnaire sent along with a cover letter stating the non-participants that the questionnaire has not been received and new questionnaires sent back.
3. Seven weeks after sending questionnaires - questionnaires and follow-up letters sent back to remind non-participant who has not sent the questionnaire back.
Referring to Dillman (1991), to improve the quality and level of the post survey responses, in this study will be used several approaches:

1. Personalization, done by signing the cover letter and questionnaire by one personally and before doing the survey, respondents will be contacted directly via email or phone.
2. Delivery of questionnaires sought to use their own courier service or delivered in person to prospective respondents (drop-off delivery) to give a sense of respect to potential respondents that are expected to increase the response rate.

a. Operationalization of Research Variables

Measurements of all variables in this study using multiple-item scales with consideration of this scale has the advantage of ease of testing the reliability and minimize the effects of errors in the analysis of statistical variance (Loo, 2002).

3.3.1. Knowledge Attributes

Knowledge Attributes

The ambiguity of knowledge refers to the uncertainty inherent and can not be reduced to conform to the components and underlying resources of knowledge and how these components interact (Birkinshaw et al., 2002; Simonin, 1999). The ambiguity of knowledge in this study refers to the study Simonin (1999) includes 13 items measured using questions 1-7 Likert scale, scale 1 = strongly disagree, 7 = strongly agree scale.

Organizational Attributes

Organizational attributes in this study assess the role of size, age, decentralization and absorption ability as a measure of organizational attributes that have an important role as an antecedent of knowledge transfer (Van Wijk et al., 2008). Organization size used in this study refers to the classification of the size of the organization based on the amount of labor that divides the organization into six size categories (Ramasamy et al., 2006) which includes: a. 0-100 labor, b. 101-250 labor, c. 251-500 labor, d. 501 - 1000 workers, e. 1000 - 2500 labor force, f. 2501-3000 labor, g. > 3000 workers. In this study, the age of the company represents and measured based on the length of time the company operates. Age organizations in this study are grouped into categories: a) 0-5 years, b) 6-10 years, c) 11-15 years, d) 16-20 years, e) 21-25 years, f) 26-30 years, g)> 30 years. The instrument consists of three items decentralization question refers to the measurement instruments used in the study of Tsai (2002). The three item of questions measured by Likert scale 1-7, scale 1 = strongly disagree, 7 = strongly agree scale.

Absorption capacity in this study is defined as an organization’s ability to recognize, assimilate and apply new external knowledge (Cohen & Levinthal, 1990). Instruments absorption capacity refers to the study conducted by Minbaeva et al. (2003) which refers to the conceptualization of Cohen and Levinthal (1990), consists of eight items of questions about the ability of labor and overall work motiation. Five questions about the ability of the overall labor force compared with the average of the organization's workforce capability competitors in the industry. The fifth statement is measured with a Likert scale 1-7, 1 = very much below average, 7 = very much above average. Three items of questions about the quality of motivation and work effort of labor compared with the average quality of labor organizations in the industry competitors, measured using a 1-7 Likert Scale, Scale 1 = strongly disagree, 7 = strongly agree scale.
Network Attributes

Network includes three main dimensions of social capital: structural dimensions, relational, and cognitive (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998). Structural dimension of social capital includes the relationship between the actor or actors in the network and can be analyzed from the perspective of attachment to the network, network configuration, and network stability. Instruments include the structural dimension of social interaction and network attachment refers to the instrument used in the study of Nahapiet and Ghoshal (1998) and a study conducted by Tsai and Ghoshal (1998), consists of four questions. These questions were measured using a Likert scale 1-7, Scale 1 = strongly disagree, 7 = strongly agree scale.

Relational dimension refers to Inkpen and Tsang (2005) which focuses on the belief that refers to the belief that the word and the promise of reliable alliance partners and that the alliance partners will fulfill their obligations in a partnership. Trust instrument consists of three questions were measured using a 1-7 Likert Scale, Scale 1 = strongly disagree, 7 = strongly agree scale.

Cognitive dimension refers to the dimension of Inkpen and Tsang (2005) which include shared goals and shared cultures. The shared goal is the degree to which organizational members share a common understanding and approach to the achievement of the task and the outcome depends on the nature of the network, tasks, and outcomes may vary. Shared cultures associated with corporate culture that is shared and understood by the alliance partners. Instruments cognitive dimension, for shared goals refer to the instrument developed by Tsai and Goshal (1998). Four questions about the cognitive dimensions were measured using a 1-7 Likert Scale, Scale 1 = strongly disagree, 7 = strongly agree scale.

3.3.2. Knowledge Transfer

In this study, knowledge transfer is defined as a process in which the unit (group, department, or division) is affected by the experience of the group, department, or other division (Liao & Hu, 2007). The instrument of transfer of knowledge from research adopted Simonin (1999) which consists of three question items. Third question items were measured using 1-7 Likert Scale, Scale 1 = strongly disagree and 7 = strongly agree scale.

3.3.3. Transfer consequent Organization

Referring to the study of Santoro & Gopalakrishnan (2000), the consequences of the transfer of knowledge is measured by the degree of institutionalization of knowledge transfer activities in universities and industry alliances to look high and low outcomes resulting from the transfer of knowledge that occurs. Constructs institutionalization of knowledge transfer activities in universities and industry alliance comprised of eight items measured using questions 1-7 Likert scale, Scale 1 indicates very low, Scale 7 shows very high.

3.3.4. Moderating variables Uncertainty

Uncertainty, conceptualized as a lack of knowledge about technology and its impact on the organization, at the time of the main technical objectives of a strategic alliance is determined. Uncertainty measurement instruments adopted technical and organizational uncertainty of research Daghfous (2004) which consists of five items the question. The fifth statement items were measured using a Likert scale 1-7, 1 indicates a very low scale once, Scale 7 shows very high.
b. Data Analysis Techniques

3.4.1 Validity and Reliability

To find out how well the instruments used, in this questionnaire, are indispensable test reliability and validity. In this study, the measurement validity is measured construct validity through convergent validity and discriminant validity. Convergent and discriminant validity of the measurement of the authors do refer to the measurements presented by Hair, et al., (1995). Hair, et al. (1995), to measure the convergent validity through variance extracted (extracted variance), whereas discriminant validity was measured by comparing the average of the square of the correlation (correlation variance) between the construct with the variance extracted of each construct. Alpha value of each variable variance extracted greater close to or greater than 0.5. The value of the extracted variance showed that all the analyzed variables have adequate convergent validity.

Reliability tests performed to estimate the extent of the measurement instruments measured through internal consistency among the items being tested with Cronbach Alpha method. Value of the rule of thumb that will be used for Crobach Alpha value must be greater than 0.7 even though the value of 0.6 is also still acceptable (Hair, et al., 1998). Measurement reliability through internal consistency values based on consideration of the possibility of error that occurs is within sampling error (Pedhazur & Schmelkin, 1991).

3.4.2. Technique of Analysis

Engineering analysis was performed using Multiple Regression Analysis to test hypotheses 1 through 4 and to test the hypothesis sub hypothesis 4.1 and 4.2 are used Moderated Regression Analysis. MRA is designed forms hierarchical regression to determine the relationship between two variables that are influenced by the moderating variable (Hair et al., 1998) to determine the type of the variable (independent predictors, moderators puree, or quase moderator).

5. Conclusion

Empirical research on knowledge transfer from university to industry is still rarely done because of lack or absence of focused and clear communication between universities and industry, and the cultural differences between the mission of the university and the industry are striking. In addition, the conceptual and empirical literature related to the issue of knowledge transfer from university to industry in Indonesia is very limited studies resulted in a significant gap when compared with other countries. These constraints provide value-added benefit of the results of the study of knowledge transfer from university to industry in Indonesia. The study is expected to fill the gap in the study of university to industry knowledge transfer within university and industry alliance and to contribute the strategic management literature to support the development of intellectual capabilities and professional knowledge for researchers in the field of management through the application of theory in the industry. Feedback especially related to the research methodology is greatly appreciated.

Reference


