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Ph.D. Dissertation

Organizational Identity
and Knowledge Sourcing
of Overseas R&D Subsidiaries

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and Knowledge Sourcing
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해외 R&D 자회사의
조직 정체성과 지식 습득

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Abstract

Organizational Identity and Knowledge Sourcing of Overseas R&D Subsidiaries

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This dissertation aims to examine the impact of organizational identity of multinational corporations' overseas R&D subsidiaries on knowledge related behaviors and consequences of those subsidiaries. Drawing upon social identity theory and capability/knowledge-based view of the firm, I focused on the complex context of an overseas R&D subsidiary and its effects on knowledge sourcing of the subsidiary. As a local entity of the multinational corporation located in the host country, a foreign subsidiary can identify itself simultaneously with more than one

target: A subsidiary is capable of identifying both with the parent organization, the multinational corporation, and with the local community in the host country. Also, a subsidiary can identify itself with the global community. These complex psychological attachments of a subsidiary can change its attitudes and behaviors to enhance its self-esteem or to reduce uncertainty. By combining literatures on organizational identification and knowledge related behaviors of multinational corporations, I addressed the question ‘how does organizational identity or organizational identification of an overseas R&D subsidiary within the complex context affect its attitudes and behaviors related to knowledge sourcing and innovation?’

In the first empirical research of this essay (Study I), I investigated the effect of relative magnitude of a R&D subsidiary’s dual organizational identification on its knowledge sourcing from the host country. I hypothesized that organizational antecedents of organizational distinctiveness, organizational prestige, inter-organizational cooperation, tenure and recent participation of

membership are related to knowledge sourcing direction as the organizational consequences. Based on social identity theory and self-categorization theory, I expected that an overseas R&D subsidiary is more likely to source knowledge from the host country when it is more autonomous; when it has clear mission as local innovator; when it is more prestigious than the parent organization (MNC); when it is less deeply embedded in the relationship with the MNC; when it is more deeply embedded in the relationship with the local community; when it spends more time in the host country; and when it was acquired by the MNC. To test these hypotheses, I used data of overseas R&D laboratories of Japanese multinational corporations. Using combinative data with the extensive survey and patent data from the U.S. patent database, the statistical analysis with generalized linear modeling shows that most of hypotheses of Study I were supported by empirical findings.

In the second part of this dissertation (Study II), I firstly demonstrate the applicability of the global identity construct to

knowledge sourcing of overseas R&D subsidiaries. Drawing upon social identity theory, social psychology and knowledge based view of the firm, I examined the impact of organizational identification of multinational corporations' overseas R&D subsidiaries on their global knowledge sourcing; knowledge sourcing from other countries (neither home nor host country). Within complex identity and knowledge context, an overseas R&D subsidiary can identify itself with its multinational corporation, with the local community in the host country and with the global community. To enhance its self-esteem or to reduce uncertainty, an overseas R&D subsidiary with global identity can change its attitudes and behaviors to specific knowledge sources for identity congruence. Based on social identity theory, I expected that an overseas R&D subsidiary is more likely to source knowledge from other countries (global knowledge sourcing) when it has clear mission as global innovator; when it is more autonomous; and when it is more deeply embedded in the relationship with the global community. Furthermore, I also hypothesized that

technological capability of an overseas R&D subsidiary can positively moderate the relationship between mission/ autonomy/ global embeddedness and global knowledge sourcing. To test these hypotheses empirically, I used data of overseas R&D laboratories of Japanese multinational corporations by combining data from the survey responses and patent data from the U.S. patent database. The results of statistical analysis with negative binomial regression model show that autonomy and global embeddedness of an overseas R&D subsidiary have positive impacts on its global knowledge sourcing and that its technological capability strengthens the relationship between its autonomy and global knowledge sourcing.

The degree of globalization of R&D by multinational corporations has increased since 1990s and the role of overseas R&D laboratories has evolved. By advancing the understanding related to these important phenomena with social identity lens, this dissertation aims to offer both theoretical arguments and practical implications. Based on two empirical studies, this essay suggests

new explanations about motivational factors of knowledge related behaviors by integrating organizational behavior researches on social identity theory and knowledge related researches on international business and strategy of multinational corporations.

Keyword : Organizational identity, Organizational identification, Knowledge sourcing, Dual organizational identity, Overseas R&D subsidiaries, Autonomy

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Chapter 1. Introduction

Under the hyper competitive environment of global knowledge based economy, sourcing, combining, and creating new knowledge has become essential mission for the multinational corporations (MNCs) because knowledge has become one of the most important source of firms' competitive advantage (Grant, 1996; Song, 2014). By acquiring and transferring knowledge from/to abroad with their globally dispersed network, MNCs can develop technologies and new products for home, host and global markets and gain a competitive edge (Song, Asakawa, & Chu, 2011). Therefore, globalization of R&D activities of MNCs has been accelerated quantitatively as well as qualitatively. An increasing number of overseas R&D subsidiaries have been established and their role and activities have been evolved from simple localization to more complex tasks. They became to source new knowledge actively from not only home or host country but also other countries and to create new technologies and new products by themselves.

However, only a few studies have examined mechanisms affecting how and why an overseas R&D subsidiary of the MNC source knowledge from the specific location. Especially, the psychological aspects, such as motivation, of knowledge related attitudes and behaviors of an overseas R&D subsidiary have been under-estimated

and under-investigated.

The process of organizational learning is inter-dependent on organizational identity closely (Corley & Gioia, 2003). Organizational identity can either facilitate or inhibit learning. The interpretation about knowledge can be changed by organizational identity. This dissertation aims to study about the impact of organizational identity related antecedents of overseas R&D subsidiaries on their local and global knowledge sourcing. Based on the rationale of social identity theory and knowledge based of the firm, I conceptualized various organizational identity related constructs and investigated their effect on the magnitude of knowledge sourcing from the specific knowledge sources, the host country or other countries, neither home nor host country. To enhance their self-esteem and to reduce their uncertainty, the members of an organization tend to move to the direction congruent with their organizational identity. Therefore, this need for identity congruence can drive changes in members' knowledge seeking attitudes and behaviors.

I argued that adopting organizational identity lens to investigate influencing factors on knowledge sourcing of an overseas R&D subsidiary can deepen our understanding to the global R&D expansion of multinational corporations both theoretically and practically. The degree

of globalization of R&D by multinational corporations from various countries has increased since 1990s. Furthermore, the role of overseas R&D subsidiaries has evolved from simple exploitation of multinational corporation headquarters' knowledge to real innovators who assimilate, acquire, and utilize knowledge from multiple knowledge sources not only for the local market but also for the global market. Within complex organizational identity and knowledge context, the members of an overseas R&D subsidiary can identify with its parent organization (home country), with its local community, and with its global community. And this organizational identification affects the members' knowledge sourcing.

Not only for the theoretical development but also for generation of useful practical implication, I conducted two related empirical studies in this dissertation. By integrating researches on organizational behavior and social psychology and studies on knowledge management of multinational corporations, I addressed my main research question: How various antecedents of organizational identity affect knowledge related behaviors and consequences of overseas R&D subsidiaries under multiple identity and knowledge contexts? By looking inside of the multiple contexts of overseas R&D subsidiaries and investigating

influencing factors related to organizational identity and their effects on knowledge sourcing of overseas R&D subsidiaries, I built up research models and empirically tested hypotheses with data of overseas R&D subsidiaries of Japanese multinational corporations in knowledge intensive industries.

Although the extant literatures have researched about knowledge sourcing of an overseas subsidiary, I believe that new insights from the perspective of organizational identity as motivational factors of knowledge sourcing behaviors have a substantial potential to advance related theory and understanding of an overseas R&D subsidiary' s local and global knowledge sourcing.

Chapter 2. Study I

Dual organizational identification and knowledge sourcing of overseas R&D subsidiaries

: Studies of overseas R&D subsidiaries of Japanese multinationals

Dual organizational identification and knowledge sourcing

of overseas R&D subsidiaries

: Studies of overseas R&D subsidiaries of Japanese multinationals

Abstract

In this empirical research, I investigated the effect of relative magnitude of a R&D subsidiary's dual organizational identification on its knowledge sourcing from the host country. I hypothesized that organizational antecedents of organizational distinctiveness, organizational prestige, inter-organizational cooperation, tenure and recent participation of membership are related to knowledge sourcing direction as the organizational consequences. Based on social identity theory and self-categorization theory, I expected that an overseas R&D subsidiary is more likely to source knowledge from the host country when it is more autonomous; when it has clear mission as local innovator; when it is more prestigious in terms of technological capability than the parent organization (MNC); when it is less deeply embedded in the relationship with the MNC; when it is more deeply embedded in the relationship with the local community; when it spends

more time in the host country; and when it was acquired by the MNC. To test these hypotheses, I used data of overseas R&D laboratories of Japanese multinational corporations. Using combinative data with the extensive survey and patent data from the U.S. patent database, the statistical analysis with generalized linear modeling shows that four of seven hypotheses of Study I were supported by empirical findings.

2.1. Introduction

The degree of globalization of R&D by multinational corporations has increased since 1990s and, therefore, the role of overseas R&D subsidiaries has evolved (Asakawa, Park, Song, & Kim, 2015). Many subsidiaries are shifting their focus from home-base/ competence exploiting role to home-base/competence augmenting(exploring) role (Kuemmerle, 1999; Cantwell & Mudambi, 2005; Birkinshaw, Hood, & Jonsson, 1998; Ambos, Ambos, & Schlegelmilch, 2006; Frost, Birkinshaw, & Ensign, 2002; Makino, Lau, & Yeh, 2002; Asakawa, 2001; Shan & Song, 1997). Corresponding to these phenomena, research interest to overseas R&D subsidiaries of multinational corporations has been increased. Despite this growing interest in knowledge related behaviors and consequences of overseas R&D subsidiaries, extant researches in the field of knowledge management and international business has limited to some determinants such as embeddedness and capability as absorptive capacity. The motivational factors which have an impact on knowledge sourcing of overseas R&D subsidiaries has been alienated from researchers' mind. In this paper, I try to fill this gap by shedding new light on the relationship between the organizational

identity related factors of overseas R&D subsidiaries and their knowledge sourcing direction.

People tend to categorize themselves and others to certain social group (Tajfel, 1972; 1978; Turner,1975; 1982; Tajfel & Turner, 1986). The need for self-esteem enhancement and uncertainty reduction is the underlying motive for organizational identification with a social group (Hogg & Terry, 2000). Positive differentiation by organization identification with a certain social group from other can enhance people' s self-esteem and make them behave more favorably to their group (Vora & Kostova, 2007). Social identity theory and self-categorization theory have explained that “by categorizing themselves into a social category, individuals adopt prototypical group characteristics, which help to provide certainty regarding who they are and how to behave.” (Hogg & Mullin, 1999; Vora & Kostova, 2007: 330) However, individuals can identify himself or herself with more than one social group and researchers' consideration about how individuals resolve contradictions and conflicts that generate from competing identity claim within multiple/hybrid identity has recently begun (Foreman & Whetten, 2002). As a specific case of multiple identity and multiple organizational identification, dual organizational identification

has defined as “an individual’s sense of identification with two organizational entities.” (Vora & Kostova, 2007: 331)

As a local entity of the multinational corporation located in the host country, a foreign subsidiary can identify itself simultaneously with two targets: A subsidiary is capable of identifying both with the parent organization, the multinational corporation, and with the local community in the host country (Roth & Kostova, 2003; Vora & Kostova, 2007). These complex psychological attachments of a subsidiary can change its attitudes and behaviors by affecting motivational factors. Members of a subsidiary can behave to enhance his or her self-esteem or to reduce uncertainty.

This paper aims to examine the impact of dual organizational identification of multinational corporations’ overseas R&D subsidiaries on knowledge related behaviors and consequences of those subsidiaries. Drawing upon social identity theory and capability/ knowledge-based view of the firm, I focused on the dual context of an overseas R&D subsidiary and its effects on knowledge sourcing of the subsidiary. By combining literatures on social organizational identity/ organizational identification and knowledge related behaviors of multinational corporations, I addressed the question ‘how does dual organizational

identification of an overseas R&D subsidiary affect its attitudes and behaviors related to knowledge sourcing and innovation?’ Based on empirical studies, this essay suggests new explanations by integrating organizational behavior researches as micro-foundation to knowledge management researches on international business and on strategy of multinational corporations.

In current research, I investigated the effect of relative magnitude of a R&D subsidiary’s dual organizational identification on its knowledge sourcing from the host country. I hypothesized that organizational antecedents of organizational distinctiveness, organizational prestige, inter-organizational cooperation, tenure and recent participation of membership of an overseas R&D subsidiary have a significant impact on its knowledge sourcing. Based on social identity theory and self-categorization theory, I suggested that an overseas R&D subsidiary is more likely to source knowledge from the host country when its autonomy is high and when it has clear mission as local innovator. And I also hypothesized that an overseas R&D subsidiary is more likely to source knowledge from the host country when it has stronger technological capability than multinational corporation headquarter and when it has spent more years in the host country as one

of the local unit. Furthermore, I tested the impact of embeddedness by expecting that an overseas R&D subsidiary is more likely to source knowledge from the host country when it is not deeply embedded in the relationship with the MNC when but it is more deeply embedded in the relationship with the local community. To empirically test suggested hypotheses, I used data of 41 overseas R&D laboratories of 24 Japanese multinational corporations. Using combinative data with the extensive survey and patent data from the U.S. patent database, the statistical analysis with generalized linear modeling shows that high autonomy, mission as local innovator, low level of internal embeddedness, and high magnitude of local external embeddedness of an overseas R&D laboratory positively influence on its local knowledge sourcing.

2.2. Theory and Hypotheses

2.2.1. Organizational identity and attitudes/behaviors of members:

Social identity theory and self-categorization theory

Researches concerning organizational identity have received increasing attention over the past decades, even though organizational

identity is not a new construct in the organizational literatures (Ashforth & Mael, 1989; Albert, Ashforth, & Dutton, 2000). Identity becomes more powerful term in strategy and organization theory literatures to explain organization attitudes and behaviors (Ibid.). A definition of identity is “those features of an organization that in the eyes of its members are *central* to the organization’ s character or self–image, make the organization *distinctive* from other similar organizations, and are viewed as having *continuity* over time.” (Albert & Whetten, 1985; Gioia, Patvardhan, Hamilton & Corley, 2013: 125). Organizational identification is defined as ‘ a perceived oneness or belongingness with an organization,’ ‘who we are as an organization’ and ‘the experience of the organization’ s successes and failures as one's own.’ (Mael & Ashforth, 1992; Gioia, Patvardhan, Hamilton & Corley, 2013).

Based on prior argument developed by Tajfel and Turner (Tajfel, 1978; Tajfel, 1981; Tajfel & Turner, 1985; Turner, 1975, 1982, 1984, 1985), Social identity theory (SIT) suggests useful applications to organizational behaviors by offering a social–psychological perspective (Ashforth & Mael, 1989; Ellemers & Haslam, 2012). Social identity theory suggests that people tend to classify or categorize both themselves and others into specific category or group which is socially

defined by prototypical characteristics from members of the categories (Tajfel & Turner, 1985; Turner, 1985; Vora & Kostova, 2007). Based on social psychology, researchers of social identity theory define social identity as “part of an individual’ s self–concept which derives from his/her knowledge of his/her membership of a social group/ groups together with the emotional significance attached to that membership” (Tajfel, 1974: 69; Ellemers & Haslam, 2012) and explain that the underlying motivation for identification of people with a group is ‘the need for positive self–esteem/ self–enhancement’ and this motive becomes in–group favoritism (Vora & Kostova, 2007). This leads people to positively differentiate their groups from other groups to enhance their self–esteem.

How separate individuals are clustered into groups is the main question of self–categorization theory, as an extension of social identity theory. According to social categorization theory, people’ s places in society are defined by social categorizations and value internalization and emotional attachment of people into group provide social identity (Turner & Reynolds, 2012). The motive for positive distinctiveness and the need to reduce uncertainty leads people to be favorable to in–group through social comparison under certain conditions and to adopt salient

group characteristics (Vora & Kostova, 2007).

As a specific case of group identification, organizational identification occurs when a member of an organization defines himself or herself in terms of the organization, adopt the defining characteristics of the organization as defining characteristics of himself or herself, and he or she personalizes the organization' s successes or failures (Dutton, Dukerich & Harquail, 1994; Mael & Ashforth, 1992). Among various motives for organizational identification, 'the need for positive self-esteem (self-enhancement) and uncertainty reduction' are regarded as the main motivations for people to identify themselves into organizations (Hogg & Terry, 2000; Vora & Kostova, 2007).

Through identity comparison process, members become aware of the gap between perceptions regarding "who I am" and "who we are" and have desire to reduce this cognitive dissonance (Foreman & Whetten, 2002). This desire or pressure to congruent shapes member' s attitudes and behaviors such as internalization, cooperation, and acceptance of change. Some researchers argue that organizational identity is one of the important ingredients of organizational cohesion and success in dispersed and complex organizations such as multinational corporations (Reade, 2001).

2.2.2. Dual organizational identity and attitudes/ behaviors of subsidiaries: Organizational identity and knowledge sourcing of overseas R&D subsidiaries

Organizational identity and Knowledge

Relationship between organizational identity and knowledge has been under-examined although these two concepts represent very fundamental in organizational studies (Nag, Corley, & Gioia, 2007). Management literatures related to these two concepts have gone another way, even though some researchers mentioned about the utility of conceptual link between them (Brown & Duguid, 2001; Kogut & Zander, 1996). Knowledge and organizational identity are interlinked and collectively manifested as attitudes and behaviors of organization members. Their knowledge influenced and were influenced “by their collective notion of who they were as an organization” (Nag, Corley, & Gioia, 2007: 841). In this study I try to demonstrate the applicability of this organizational identity construct to knowledge related behaviors by applying these concepts and related arguments to organizational identity and knowledge sourcing of overseas R&D subsidiaries

Dual organizational identity of overseas R&D subsidiaries

People and organization can have multiple identities (Foreman & Whetten, 2002). Individuals are “collection of identities resulting from their multiple roles in society” and from “their social categories to which one belongs as memberships that help define who I am” (Hillman, Nicholson & Shropshire, 2008: 441, 442). These ‘hybrid identities’ shape people’s attitudes and behaviors in a certain context.

Then, more specifically, what is dual organizational identification? Vora and Kostova (2007) defined dual organizational identification as ‘An individual’s sense of identification with two organizational entities, which could be at various levels’ and they applied this concept to Multinational Corporation (MNC). As one of the members of a multinational corporation, an overseas subsidiary naturally faces multi-country and multi-identity context. Due to extreme heterogeneity and complexity inherent in MNC, it is difficult to emerge shared norms and values (Kostova & Roth, 2003). Overseas subsidiaries can suffer from conflicting requirements originated in different relatives’ expectations (Vora & Kostova, 2007).

As I mentioned above, people identify themselves into

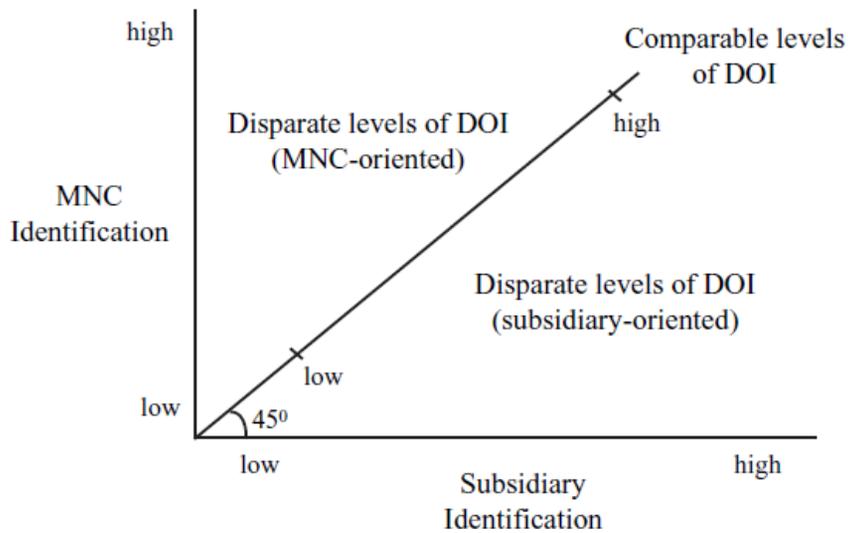
organizations due to enhance their self-esteem and to avoid risk. Under the desire for self enhancement and uncertainty reduction, “groups seek positive differences between themselves and reference groups.” (Tajfel, 1978, 1981; Ashforth & Mael, 1989: 31) In inter-group comparison within dual organizational identification context, members assess the degree of gap between “their conceptions of the organization’s current identity” and “their expectations of its ideal identity” and this congruence gaps can significantly affect a member’s attitudes and behaviors such as commitment (Foreman & Whetten, 2002: 641).

Vora and Kostova(2007) suggested the concept of relative magnitude of an overseas subsidiary’s dual organizational identification. The members of a subsidiary can identify more with one entity rather than the other one. Also, they can identify with both the multinational corporation and a local unit at comparable level. It refers to “the relative strength of the sense of identification with each of two entities; multinational corporation and subsidiary/ local unit (Ibid. : 331). As depicted [Figure 2-1], the members of a subsidiary can have higher organizational identification with a local unit than the multinational corporation. They become disparate subsidiary oriented dual

organizational identification. Also, the members of a subsidiary can have higher organizational identification with the multinational corporation rather than a local subsidiary. They become disparate multinational corporation oriented dual organizational identification. Because the relative potential of each target to fulfill the needs of members for enhancement in self-esteem and reduction in their uncertainty determine where they located in this 2-dimensional graph and, therefore, have a significant impact on how they recognize and behave, this relative magnitude of an overseas subsidiary' s dual organizational identification is important.

Then, which factors can influence on relative magnitude of an overseas subsidiary's dual organizational identification and its knowledge sourcing behaviors? In this section, I develop hypotheses about organizational level antecedents to dual organizational identification of overseas R&D subsidiaries and their relative knowledge sourcing proportion from home and host country based on organizational identity related literatures.

[Figure 2-1] Relative magnitude of an overseas subsidiary's dual organizational identification



Source: Relative magnitude of dual organizational identification, (Vora & Kostova, 2007: 332p)

I hypothesized that organizational antecedents of organizational distinctiveness in terms of subsidiary mission and autonomy; organizational prestige in terms of technological capability; inter-organizational cooperation and embeddedness; tenure in the host country and recent participation of membership in multinational corporation of an overseas R&D subsidiary have a significant impact on its knowledge sourcing from host country by changing the relative magnitude of an overseas subsidiary' s dual organizational identification.

Organizational distinctiveness

Organizational distinctiveness differentiates the organization from other organizations and provides a sharper and more salient definition for organizational member, thereby attract a passionate following of members (Mael & Ashforth, 1992). In dual organizational identification context, members of overseas R&D subsidiaries can identify with both their parent corporations and the local research community. However, the relative strength of the sense of identification with these two groups can be differentiated by their autonomy and their mission.

Ishii (2012: 1123) pointed out that “autonomy appeared to be important to develop and maintain identification with a particular entity” .

Subsidiaries with high autonomy in terms of both decision-making and resources generate their own knowledge and respond to the local market. Identifying with such a distinctive and independent subsidiary helps to fulfill their need for a positive self-esteem and uncertainty reduction (Vora & Kostova, 2007). When members of an overseas R&D subsidiary have autonomy in decision making in the subsidiary, they identified with the subsidiary more strongly than with the MNC (Ishii, 2012). Stronger identification with the subsidiary as local unit which located in the host country make members favor things in the host country and open to local community. Thereby, members of overseas R&D subsidiaries will source relatively more knowledge from host country when their subsidiaries have high level of autonomy.

Hence, I hypothesize:

H1a An overseas R&D subsidiary is more likely to source knowledge from the host country when it is more autonomous from the MNC HQ.

Mission or mandate of a subsidiary is defined as any subsidiary responsibility that extends beyond its tasks (Birkinshaw, 1996). While

people enact with their organizational identity, they attempt to live up the ideals embodied in the organization' s mission and values (Ashforth, Harrison, & Corley, 2008). People may feel their work is rewarding when it is consistent with the organization' s mission. An overseas R&D subsidiary can have three mutually exclusive missions: localization, local innovation, and global innovation. An overseas R&D subsidiary with local innovation mandates has incentive to interact with local community and favor local knowledge sourcing. Also, stronger identification with the subsidiary as local unit by local innovator mission make members identified with the subsidiary more strongly than with the MNC. In this case, to fulfill self-enhancement and uncertainty reduction, members are more likely to source knowledge from local than from home or other countries.

Hence, I hypothesize:

H1b An overseas R&D subsidiary is more likely to source knowledge from the host country when it has clear and distinctive mission as local innovator.

Organizational prestige in terms of technological capability

The perceived prestige of the institution can be one of antecedents of organizational identification (March & Simon, 1958; Mael & Ashforth, 1992). Because individuals prefer a group with prestige to a group without it because they want to enhance self esteem by identification. Therefore, people often cognitively identify themselves with a winner (Ashforth & Mael, 1989). The greater the potential boost to self-esteem through identification when the more prestigious the organization (Mael & Ashforth, 1992).

The engine of subsidiary growth is its distinctive capabilities (Birkinshaw, 1996). For an overseas R&D subsidiary, technological capability is one of the most important factors as absorptive capacity, because technological capabilities directly impact knowledge- and innovation-related behaviors and performances of overseas R&D subsidiaries (Cohen & Levinthal, 1990). Therefore, members of overseas R&D subsidiaries try to identify with the unit who has stronger technological capability and this preference can affect relative magnitude of an overseas subsidiary's dual organizational identification by comparison technological capability of MNC HQ with that of subsidiary. When the overseas R&D subsidiary has stronger and more distinctive technological capability than the multinational corporation, members of

the overseas R&D subsidiary will identify more with the local unit than the parent firm and they will favor and trust local information. Therefore, in this case, the overseas R&D subsidiary will source more knowledge from the host country than from home or other countries.

Hence, I hypothesize:

H2 An overseas R&D subsidiary is more likely to source knowledge from the host country when it is more prestigious than other parts of the MNC R&D networks.

Inter-organizational cooperation and embeddedness: MNC internal / Local

During the competition, group boundaries become more sharply drawn and the differentiation between in-group and out group can be accentuated (Brown & Ross, 1982; Friedkin & Simpson, 1985). In this case, members of the organization can identify with organization more easily and favor in-group more sharply (Mael & Ashforth, 1992). On the other hand, during the cooperation and interaction, group boundary become more shade off gradually without definite border. Therefore, in this case, members of the organization can identify comparably with multiple units when they are in the multiple identification contexts.

These are applicable to the overseas R&D subsidiary's identification and behaviors. The embeddedness of foreign subsidiaries may influence the behavioral and cognitive patterns of foreign subsidiaries (Song, Asakawa, & Chu, 2011). The outcome of embeddedness in the relationship with units within MNC network and outside may be both positive and negative to source knowledge from the host country.

Frequent interactions with MNC HQ can make members of the overseas R&D subsidiary more MNC-oriented. Strong and frequent involvement of members from MNC HQ can facilitate cognitive lock-in of the members of the overseas R&D subsidiary (Grabher, 1993). These make people tends to isolate the actors from the outside (Gargiulo & Benassi, 2000). And strong internal embeddedness may create the group-think phenomenon (Janis, 1972) and strengthen isomorphic pressure from inside (Rosenzweig & Singh, 1991; Asakawa, 1996). On the other hand, frequent interaction with members of MNC HQ can facilitate trust and cooperative mood between MNC HQ and the overseas R&D subsidiary (Coleman, 1988). Therefore, the members of the overseas R&D subsidiary will be more MNC-oriented when their subsidiary is more deeply embedded in the cooperative relationship

between MNC HQ and the subsidiary. Thereby, internal embeddedness of the overseas R&D subsidiary may discourage it from searching for knowledge outside the organization (Hansen, 1999; Gargiulo & Benassi, 2000)

Hence, I hypothesize:

H3a An overseas R&D subsidiary is more likely to source knowledge from the host country when it is less deeply embedded in the relationship with the MNC HQ

On the other hand, frequent interactions with local units which are located in the local community with the overseas R&D subsidiary can make members relatively more local-oriented. Frequent interaction with the local people can facilitate openness to local community and information. Therefore, the members of the overseas R&D subsidiary will be more local-oriented when their subsidiary is more deeply embedded in the cooperative relationship between local external and the subsidiary. Thereby, local external embeddedness of the overseas R&D subsidiary may encourage it to search and source knowledge from the host country.

Hence, I hypothesize:

H3b An overseas R&D subsidiary is more likely to source knowledge from the host country when it is more deeply embedded in the relationships with local entities.

Organizational tenure/ Recency of membership

Though the slope of the association between the time and organizational identification strength should gradually decrease over time, a person who spend heavy amount of with an organization can identify with the organization more strongly and as time passes, the sense of belongingness and shared destiny would be strengthened (Mael & Ashforth, 1992). Therefore, how many times spend in the host country or with the multinational corporation can affect to the relative magnitude of an overseas subsidiary' s dual organizational identification.

When the overseas R&D subsidiary was established quite a long time ago and maintained local operations for a long time, members of the overseas R&D subsidiary would identify more with the local community than the parent firm. It leads to their local favoritism in information exchange and knowledge search. Therefore, in this case, the overseas

R&D subsidiary will source more knowledge from the host country than from home or other countries. On the other hand, when the overseas R&D subsidiary became a recent member of the multinational corporation due to merger or acquisition, members of the overseas R&D subsidiary would identify more with the local community than the parent firm because they do not have enough time to assimilate to the multinational corporation. Therefore, the overseas R&D subsidiary will also source more knowledge from the host country than from home or other countries when they became the member of the multinational corporation recently by merger or acquisition.

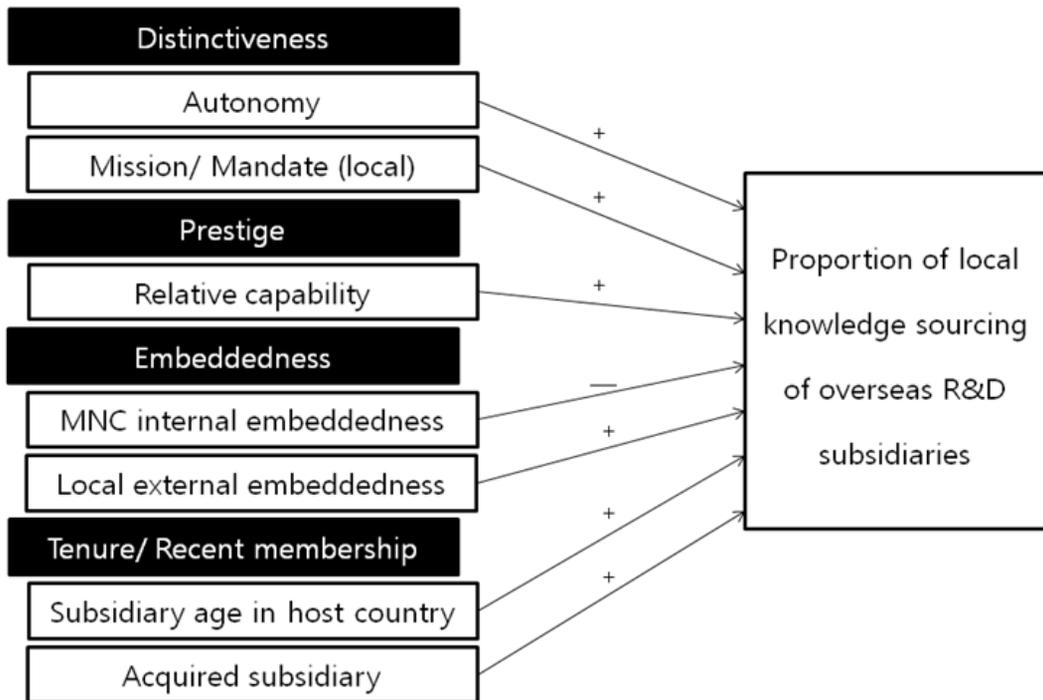
Hence, I hypothesize:

H4a An overseas R&D subsidiary is more likely to source knowledge from the host country when it spends more time in the host country.

H4b An overseas R&D subsidiary is more likely to source knowledge from the host country when it acquired by the multinational corporation.

[Figure 2-2] summarizes the hypotheses suggested above.

[Figure 2-2] Research model



2.3. Methods

2.3.1. Sample

To test suggested hypotheses related to organizational identity and knowledge sourcing of overseas R&D subsidiaries empirically, I used data of overseas R&D laboratories of Japanese multinational corporations. Because my research model is about the relationship between dual organizational identity of a R&D subsidiary and its knowledge sourcing direction, I needed to collect and combine data from two sources, the survey which was conducted by Asakawa, one of my co-author in other papers, and the patent database.

My sample was derived from the extensive survey which was conducted by Asakawa. To collect data from the overseas R&D subsidiaries of Japanese multinational corporations, the survey conductor extracted the list of the overseas R&D subsidiaries from Toyo Keizai which contains and publishes the comprehensive data on the Japanese firms' overseas operations every year. At first, 497 overseas R&D subsidiaries were selected. The extensive survey questionnaires were mailed to the overseas R&D subsidiaries in the list. In total, 102

out of 497 subsidiaries participated in the survey, with the response rate of 21% and of which, 99 responses turned out to be effective, with the effective response rate of 20%.

The survey data were composed of responses from 99 overseas R&D labs of 62 major Japanese multinational corporations. Due to my research focus on the characteristics of R&D subsidiaries and their knowledge sourcing activities, I only included labs which applied and registered patents successfully in the U.S. Patent and Trademark Office (USPTO) between 2001 and 2006 because the survey questionnaire asked about the characteristics of an overseas subsidiary of year 2000.

I collected data on overseas R&D labs which applied patents from 2001 to 2006 from both the survey response and their U.S. patent registration records. The data from the survey were used to construct my independent variables and control variables. I extracted patent data from the USPTO patent database to measure my dependent variable, the magnitude of knowledge sourcing of an overseas R&D subsidiary from the country where it is located. Patent data have become popular indicators of knowledge flow and creation for the researchers over the past decades (Hall, Jaffe, & Tranjteberg, 2000). USPTO patent database have released patent documents that offer general and specific

information about patents. The documents include data, such as the patent title, technology type and claims, the name of assignees and inventors, and the geographical residence of assignees and inventors, which I need to collect for the empirical analysis. They also offer reference/citation information which is frequently used as a way to capture knowledge flows (Almeida, 1996; Jaffe, & Tranjteberg, 2002; Singh, 2004; Song, Almeida, & Wu, 2003). Due to invisible characteristics, it is not easy to trace how knowledge flows among individuals or organizations and how these knowledge flows become the foundation of new invention. Nevertheless, patent citation information gives us a clue of ‘how a new piece of technological knowledge builds on existing knowledge’ (Singh, 2005). The list of citations for each patent is specified in the application and examination process to show which prior inventions provide a foundation for the new ones. A citation of patent A by patent B means patent B builds on existing knowledge embodied in patent A. Thus, it is possible to infer significant influences on a particular invention and to track knowledge building across individuals, organizations, and geographic boundaries. Although it has some drawbacks to utilize patents and patent citation data as measures of knowledge flow, by comparing patent data and survey data, prior

studies show that the correlation between patent citations and actual knowledge flow is high (Jaffe & Trajtenberg, 2002).

Therefore, following previous researches, I used backward patent citation data to capture knowledge flows from other countries (neither home nor host country) to overseas R&D labs. I excluded overseas R&D labs which did not apply patents in USPTO from the sample because it is impossible to trace their knowledge sourcing activities through USPTO data. I allowed a time lag of at least one year from the time point of the survey data (2000) and collected patent data from 2001 to 2006 because I needed to consider time spent to complete research projects and patent application processes. Due to a potential bias from fluctuations by years, I decided to limit my observation period to six years. As a result, my sample covered 617 patents from 41 overseas laboratories of 24 major Japanese MNCs. The geographic distribution and industry classification of my sample labs are shown in [Table 2-1] and [Table 2-2].

[Table 2-1] Distribution of overseas R&D labs by host country

Country	Number of labs in our sample
USA	21
Germany	6
Great Britain	6
France	2
Australia	2
China	2
Others	2
Total	41

[Table 2-2] Classification of overseas R&D labs by industry

Industry	Number of labs in our sample
Chemical	6
Pharmaceutical	6
Steel	1
Machinery	0
Electronics	12
Automobile	8
Precision	1
Telecommunication	7
Others	13
Total	54

(The number of subsidiary = 41, The number of industry count is 54 because we allowed multiple industry choice in the survey.)

2. 3. 2. Variables and measures

The dependent variable: Local knowledge sourcing

The dependent variable of this paper, the relative magnitude of ‘local’ knowledge sourcing within total knowledge sourcing of overseas R&D labs of Japanese multinational corporations, was measured at the patent level. Local knowledge sourcing is defined as knowledge sourcing from the country where an overseas R&D subsidiary is located. I operationalized the dependent variable as the proportion of backward citations that each patent makes to any patent which was applied by assignees or inventors who resided in host countries, because the main argument of this paper is the relative magnitude of dual organizational identification of an overseas R&D subsidiary has an influence on the knowledge sourcing direction within diverse sources.

At first, to construct my dependent variable, I needed to find the patents which were applied by overseas R&D laboratories in my sample. I searched for the U.S. patent database by subsidiary or multinational corporation name and then verified patents of my sample subsidiaries by the location information of assignees and inventors of the patents. Then, to identify knowledge sources, I collected detail information, such as

name and location of assignees and inventors of patents which were cited by the patents of overseas R&D labs in my sample. After matching and merging these data about citation, I divided and counted the number of citation by the sources. Then, I use the following formula:

$$P_i = \frac{\text{The number of citations to the patents from the host country of the patent } i}{\text{The total number of citations of the patent } i}$$

Therefore, P_i reflects the proportion of citations made by the subsidiary to local knowledge sources, individuals or organizations located in the host country. As increase in this proportion measure indicates an increase in the degree to which a patent is based on knowledge from the host country, of overseas R&D subsidiaries.

I employed a generalized linear model (GLM) with a logit link and the binomial family to investigate the factor influencing the relative magnitude of local knowledge sourcing, because dependent variable of this essay was measured by the proportion of backward citations to the patent applied by assignees or inventors who resided in the host country.

I also included the robust option in the GLM model to obtain

robust standard errors. The unit of analysis of empirical test was individual patents granted to the 41 overseas R&D labs that were applied in USPTO from 2001 to 2006. I clustered standard errors by overseas R&D labs, since my data include multiple observations for each lab.

The independent variables: Relative dual organizational identity

To construct independent variables and control variables of this paper, I extracted several data from the survey response data. Because I tried to examine the impact of influencing factors related to relative dual organizational identity of an overseas R&D subsidiary on its knowledge sourcing behavior, all of independent variables were subsidiary level variables.

The survey questionnaire covered characteristics of a subsidiary and the interactions among organizations, such as decision making, information exchange, research collaborations with MNC HQ or other subsidiaries. It also included questions about the interaction with other firms or organizations such as universities and research institutes which were located in the host country or other countries. Each item of the survey was measured by the five point Likert scale. I provide more detailed explanation about each variables and the way to measure them

below.

Because I used multiple items of the survey questionnaire to construct some independent and control variables, I needed to identify the items used in each variable and then test the composite reliability of them. I conducted factor analysis and the Cronbach' s alpha test to build the construct and to check composite reliability. Composite reliability assesses the internal consistency of a measure which reflects the coherence of the components of a scale. Internal consistency is usually tested by Cronbach' s alpha in previous literature which used survey data. Based on the result of the factor analysis, I selected items to measure each construct and computed Cronbach' s alpha score of them. The results of Cronbach' s alpha test are displayed in [Table 2–3]. All Cronbach' s alpha score of variable items were significantly high with the lowest value in excess of 0.60 and the highest value over 0.95. Except for just one measure, all coefficient alpha of the scale exceeded the 0.70 level recommended by Nunnally (1978) and the lowest value was above 0.60, satisfactory level. Based on these results, I averaged selected item scores and used them for regression, because inter–item reliability was high enough to do so.

Autonomy (Knowledge) Survey items regarding the freedom of decision

making related to knowledge section, such as the selection of research projects and the publication, were used for making an index.

Mission (Local innovator) I coded 1 for ‘innovation for the local market’ as the mission of the lab and coded 0 for other answers.

Relative capability To measure technological capabilities of both units, I built composite indices based on the results of the factor analysis of survey items related to the capabilities of each R&D unit. Respondents also answered questions associated with their degree of understanding of technology trends and absorption of new science and technologies and HQ’ s. Then, I divided the index of subsidiary’ s capability by the index of MNC HQ’ s capability.

Embeddedness I computed the degree of closeness in internal embeddedness by a composite index that was made based on the survey response, following methods of prior literatures which measure the degree of embeddedness (Pugh & Hickson, 1976; Song, Asakawa, & Chu, 2011).

Internal embeddedness (HQ) The degree of internal embeddedness within the relationship between the subsidiary and the parent firm(MNC HQ) was computed by constructing a composite index based on the survey. I extracted some survey items associated with knowledge–

related/ technological interaction between an overseas R&D lab and MNC HQ based on the results from factor analysis and Cronbach' s alpha test. The survey included questions regarding frequency of knowledge–related/ technological interaction, such as joint research projects, transfer of technology/ knowledge, and movement of researchers and engineers. Based on the value measured by five point Likert scale, I made a composite index about internal embeddedness by computing average.

Local external embeddedness As I measured the degree of internal embeddedness, a proxy measure of local external embeddedness was computed by constructing a composite index based on the survey. The survey included questions about the frequency of collaborations with organizations located in the host country. I selected items of knowledge related interaction with local units outside an MNC and made a composite index for a proxy measure of local knowledge embeddedness.

Years in host countries How many years the lab spend in the host country was measured by counting years of operation based on the survey response about founding year of the lab. Due to skewed distribution, I took natural logarithm for the local age of the lab.

Acquired by MNC I coded 1 for 'acquisition' as the entry mode and

coded 0 for other answers.

Control variables

To capture pure effects of our independent variables on local knowledge sourcing, I included control variables based on patent data and the survey data. Control variables were measure as follows.

Industry dummy I coded 1 for ‘chemical/ pharmaceutical’ as an industry and coded 0 for other answers

Western dummy I coded 1 when the lab is located in ‘European countries or USA’ and coded 0 when the lab is located in other regions, such as Asia, Oceania.

Nationality of Head I coded 1 when the head of the subsidiary is ‘Japanese’ and coded 0 when the head is non–Japanese citizen.

Self citation Because path dependent technologies may manifest a sense of self–sufficiency and inertia (Nelson & Winter, 1982; Kim & Song, 2007), I also controlled for the number of citations to the own prior patents of our sample labs.

General relationship with HQ I measured the degree of general interaction of an overseas R&D laboratory with MNC HQ by constructing a composite index based on the survey response. There were several

questions regarding interaction of an overseas R&D lab with its Japanese MNC HQ in the survey. Based on the results from the factor analysis, I selected and composed an index with survey items related to interaction between them in the form of information transmission and participation in decision making processes. The frequency and magnitude of vertical behavioral interaction were measured by five point Likert scale.

Linkage with other subs The degree of linkage with other subsidiaries within the same MNC was computed in the similar way to measure other embeddedness and relation related variables. In the survey, I selected items about the relationship of an overseas R&D lab with other overseas R&D units within the MNC. Based on the values measured by the frequency of joint research projects, transfer of technology/ knowledge, and movement of researchers and engineers between two R&D units within MNC, I made a composite index for measurement of the degree of linkage with other subsidiaries by computing average score of items.

Linkage with global partners A measure of linkage with global partners was also computed by constructing a composite index based on the survey. The survey included questions about the frequency of collaborations with organizations located in other countries, excluding the home or the host country, outside MNC, such as universities and

venture firms. As I did for other independent or control variables, I selected items and computed values based on the results of the factor analysis.

Mission (Global innovator) I coded 1 for ‘innovation for the global market’ as the mission of the lab and coded 0 for other answers.

Managerial control I also measured the degree of managerial control by constructing index with the survey response data. Based on the results from the factor analysis, I selected and composed an index with survey items related to control behaviors in a subsidiary’ s decision such as recruitment, performance appraisal, and promotion.

[Table 2-3] Cronbach's alpha score of factor for survey items

Variables	Items	Cronbach's α
General relationship with HQ	4	0.7877
Linkage with other subs	3	0.7410
Linkage with global partners	2	0.6149
Managerial control	6	0.8255
Autonomy	3	0.9137
Subsidiary capability	4	0.7173
HQ capability	4	0.9564
Internal embeddedness (HQ)	3	0.7241
Local external embeddedness	2	0.9163

2.4. Results

The summary of descriptive statistics and correlation matrix of the variables are presented in [Table 2–4] and [Table 2–5].

[Table 2–4] Descriptive statistics of variables

		Mean	Standard Deviation	Min	Max
v1	The proportion of local knowledge sourcing	0.405	0.343	0.00	1.00
v2	Industry dummy	0.190	0.392	0.00	1.00
v3	Western dummy	0.945	0.228	0.00	1.00
v4	Nationality of Head	0.746	0.436	0.00	1.00
v5	Self citation	0.371	1.176	0.00	14.00
v6	General relationship with HQ	3.590	0.647	1.00	4.50
v7	Linkage with other subs	1.522	0.581	1.00	3.33
v8	Linkage with global partners	2.101	0.932	1.00	4.50
v9	Mission (Global innovator)	0.230	0.421	0.00	1.00
v10	Managerial control	1.875	0.702	1.00	5.00
v11	Autonomy (Knowledge)	3.076	1.132	1.00	5.00
v12	Mission (Local innovator)	0.708	0.455	0.00	1.00
v13	Relative capability	1.008	0.427	0.27	4.75
v14	Internal embeddedness (HQ)	2.814	0.799	1.00	4.00
v15	Local external embeddedness	2.826	0.941	1.00	5.00
v16	Years in host countries	2.550	0.672	0.69	3.78
v17	Acquired by MNC	0.392	0.489	0.00	1.00

[Table 2-5] Correlation matrix of variables (* if $p < 0.05$)

	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15	v16	v17
v1	1.000																
v2	-0.213*	1.000															
v3	0.221*	0.008	1.000														
v4	0.223*	-0.581*	0.120*	1.000													
v5	0.071	0.248*	0.064	-0.192*	1.000												
v6	0.322*	-0.325*	0.075	0.447*	-0.116*	1.000											
v7	-0.180*	0.467*	0.078	-0.422*	0.139	-0.083*	1.000										
v8	-0.269*	0.265*	-0.177*	-0.279*	0.073	-0.283*	0.232*	1.000									
v9	-0.204*	0.669*	0.098*	-0.441*	0.240*	-0.596*	0.375*	0.524*	1.000								
v10	0.216	-0.053	-0.056	0.361*	-0.104*	0.327*	-0.311*	-0.263*	-0.364*	1.000							
v11	-0.264	0.443*	0.115*	-0.544*	0.184*	-0.719*	0.259*	0.350*	0.721*	-0.667*	1.000						
v12	0.302	-0.581*	0.095*	0.517*	-0.192*	0.625*	-0.342*	-0.467*	-0.852*	0.327*	-0.679*	1.000					
v13	-0.199*	0.483*	-0.022	-0.597*	0.197*	-0.410*	0.465*	0.061	0.459*	-0.322*	0.469*	-0.538*	1.000				
v14	0.157*	-0.466*	0.071	0.377*	-0.115*	0.335*	-0.493*	0.006	-0.391*	0.318*	-0.502*	0.372*	-0.482*	1.000			
v15	0.063	-0.183*	-0.061	0.046	-0.054	0.174*	-0.204*	0.652*	-0.032	-0.036	-0.182*	0.070	-0.224*	0.562*	1.000		
v16	0.184*	-0.513*	0.001	0.539*	-0.175*	0.461*	-0.418*	-0.064	-0.490*	0.222*	-0.485*	0.553*	-0.537*	0.709*	0.486*	1.000	
v17	-0.173*	0.416*	0.136*	-0.331*	0.139*	-0.141*	0.664*	0.302*	0.578*	-0.539*	0.518*	-0.551*	0.470*	-0.483*	-0.087*	-0.364*	1.000

[Table 2–6] Results of generalized linear model

	Model I	Model II
Control variables		
Industry dummy	-1.418 (0.871)	-2.122 *** (0.595)
Western dummy	1.555 * (0.811)	0.075 (1.012)
Nationality of Head	-0.545 (0.672)	-0.041 (0.395)
Self citation	0.165 *** (0.037)	0.175 *** (0.026)
General relationship with HQ	0.918 ** (0.372)	1.285 *** (0.336)
Linkage with other subs	-0.268 (0.220)	1.144 *** (0.298)
Linkage with global partners	-0.374 * (0.206)	-2.357 *** (0.388)
Mission (Global innovator)	1.345 (0.962)	3.808 *** (1.114)
Managerial control	0.399 (0.256)	1.490 *** (0.302)
Independent variables		
Autonomy (Knowledge)		1.260 *** (0.304)
Mission (Local innovator)		1.503 ** (0.736)
Relative capability		-0.490 (0.364)
Internal embeddedness (HQ)		-0.652 *** (0.248)
Local external embeddedness		2.238 *** (0.340)
Years in host countries		-0.517 (0.388)
Acquired by MNC		-0.866 (0.545)
Cons	-4.488 *** (1.612)	-12.654 *** (2.776)
AIC	1.014	0.952
BIC	-3595.740	-3602.934
Log pseudolikelihood	-302.749	-276.665

1) * if $p < 0.10$, ** if $p < 0.05$, *** if $p < 0.01$

2) Standard errors in the parentheses

[Table 2–6] presents statistical findings from generalized linear model (GLM) with a logit link and the binomial family and clustering option by subsidiary. The table includes statistics of 2 models: the baseline model with control variables (model I) and the model with independent variables (model II).

The result of the base model which had control variables only is presented in Model I. Among control variables, the coefficients of western dummy, self citation, general relationship with HQ, and linkage with global partners are statistically significant. This result show that an overseas R&D laboratory acquires relatively more knowledge from individuals or organizations located in the host country than other sources when the lab is located in Europe or USA, when it interacts with MNC HQ, and when it is path dependent. On the other hand, an overseas R&D laboratory is less likely to source knowledge from the host country when they collaborate with global partners more frequently.

In model 2, I put independent variables to the baseline model to find empirical evidence of my arguments related to relative dual organizational identity and local knowledge sourcing of an overseas R&D subsidiary. This model (model II) shows that most of main hypotheses which I suggested above were supported statistically by

my sample. The coefficient of autonomy is highly significant ($p < 0.01$) and positive. This finding supports hypothesis 1a, suggesting that an overseas R&D laboratory source more knowledge from the host country when it is more autonomous in its decision making related to knowledge seeking behaviors. The coefficient of mission as local innovator is also positive and significant ($p < 0.05$) as I expected. This means that an overseas R&D subsidiary tends to source knowledge from the host country when it is mandated to seek innovation for local market. Therefore, hypothesis 1b is also supported by empirical analysis. So empirical findings supports my argument, an overseas R&D subsidiary is more likely to source knowledge from the host country when it has more distinctive identity as local entity from MNC by its autonomy and mission.

However, the coefficient of relative capability is negative and insignificant. This means that hypothesis 2 (organizational prestige and local knowledge sourcing) was not supported statistically.

Both of hypotheses related to embeddedness were supported by my sample. In model II, the coefficient of internal embeddedness in the relationship between an overseas R&D subsidiary and its MNC headquarter is negative and statistically

significant ($p < 0.01$), as I expected. Furthermore, the coefficient of local external embeddedness is positive and highly significant ($p < 0.01$). These results show that hypothesis 3a and hypothesis 3b were supported statistically, suggesting that internal embeddedness and external embeddedness of an overseas R&D subsidiary have a significant impact on its knowledge sourcing. An overseas R&D subsidiary is more likely to source knowledge from the host country when it is less deeply embedded in the relationship with the MNC HQ and it is more likely to source knowledge from the host country when it is more deeply embedded in the relationships with local entities.

But the coefficients of both variables related to organizational tenure are not significant. Against my expectation based on dual organizational identification perspective, the coefficient of years in host countries is negative and insignificant and that of acquisition dummy variable is also negative and insignificant. Therefore, neither hypothesis 4a nor hypothesis 4b was supported.

Due to possibility of spurious correlation by different level of technological development of the host country, I added a host country level variable as control variable to the model. I collected data from WIPO (World Intellectual Property Organization) IP

Statistics Data Center about the relative patent publication size between home country and the host country by industry. Relative country patent by industry was defined as the relative magnitude between average number of patent publications of the host country and average number of patent publications of the home country (Japan). The results of model with relative country patent variable were exactly same as the results of the model without this variable. Four hypotheses (H1a, H1a, H3a, and H3b) were supported significantly but other three hypotheses (H2, H4a, and H4b) were not supported by the statistical analysis.

Furthermore, I also employed other statistical models instead of generalized linear regression model to test sensitivity of the model specification. The Tobit model and Negative binomial regression model were used for sensitivity tests. The results of both models were almost same as the results of generalized linear regression model. The results show that the sign of the coefficient of variables were same as that of the original model. Only the significances of two variables were changed for the Negative binomial regression model.

2.5. Conclusions and Discussions

In this paper, I try to fill the gap in the literature on knowledge related behaviors and consequences of multinational corporations' overseas R&D subsidiaries in several ways. First, I examined the determinants of knowledge sourcing by linking social identity theory and subsidiary' s knowledge sourcing related literatures. Since discussions of the relevance of organizational identity of multinational corporations' overseas R&D subsidiaries in explaining knowledge sourcing behaviors of them has been limited in prior literatures, the current research has a room to contribute for related research stream. Second, by employing the concept of organizational identity congruence, the current research sheds light on the motivational part of knowledge sourcing, which was under-estimated in prior literatures. And, I empirically tested the impact of relative degree on dual organizational identification of multinational corporations' overseas R&D subsidiaries by integrating survey data and patent citation data.

In this research, I hypothesized organizational distinctiveness in terms of mission/mandate and autonomy, prestige in terms of technological capability in comparison with MNC HQ, embeddedness, and membership endurance of an overseas R&D subsidiary within dual organizational identification will have a significant impact on its relative degree of knowledge sourcing from

the host country. The statistical results from generalized linear modeling shows more than half of hypotheses which I suggested were supported by sample. However, hypotheses related to relative capability and recent membership in organization were not supported by statistical analysis.

This paper has several limitations. At first, because I used the data from the survey response from Japanese multinational corporations' overseas R&D subsidiaries only, generalization of this paper' s results can be limited due to single country of origin problem. I call for another future study to replicate these hypotheses testing with the data from other countries. Another limitation of this paper is level of analysis. Due to limited sample size and mix of level (patent – subsidiary), I employed generalized linear modeling with robust and clustering option to control bias from multiple patents of one subsidiary. However, in this case, multi-level modeling such as hierarchical model will be more appropriate to deal this type of data. Future studies could reflect this.

In conclusion, the purpose of this paper was to find the determinants of overseas R&D subsidiaries' knowledge sourcing based on new perspective by linking organizational identity theory and knowledge based view of the firm. Drawing upon dual

organizational identification perspective within multinational R&D network, this study shed new light on the dynamics of identity-knowledge related behaviors and consequences of overseas R&D subsidiaries. By employing this fresh approach, I try to suggest new insight about control mechanism of overseas R&D subsidiaries. Not only formal structure and control system but also informal relation and cognitive based soft control mechanism can influence on activities and performance of overseas R&D subsidiaries.

Chapter 3. Study II

Global identity and global knowledge sourcing of overseas R&D subsidiaries

: Studies of overseas R&D subsidiaries of Japanese multinationals

Global identity and global knowledge sourcing
of overseas R&D subsidiaries

: Studies of overseas R&D subsidiaries of Japanese multinationals

Abstract

This study is the first to demonstrate the applicability of the global identity construct to knowledge sourcing of overseas R&D subsidiaries. Drawing upon social identity theory, social psychology and knowledge based view of the firm, I examined the impact of organizational identification of multinational corporations' overseas R&D subsidiaries on their knowledge sourcing from other countries (neither home nor host country). Within complex identity and knowledge context, an overseas R&D subsidiary can identify itself with its multinational corporation, with the local community in the host country and with the global community. To enhance its self-esteem or to reduce uncertainty, an overseas R&D subsidiary can change its attitudes and behaviors for identity congruence. Based on social identity theory, I expected that an overseas R&D subsidiary is more likely to source knowledge from other countries (global knowledge sourcing) when it has clear mission as global innovator; when it is more autonomous; and when it is more deeply embedded in the relationship with the global community.

Furthermore, I tested the moderation effect of technological capability of an overseas R&D subsidiary on the relationship between mission/ autonomy/ global embeddedness and global knowledge sourcing. To test these hypotheses empirically, I used data of overseas R&D laboratories of Japanese multinational corporations. Using combinative data with the extensive survey and patent data from the U.S. patent database, the results of statistical analysis with negative binomial regression model shows that autonomy and global embeddedness have a positive impact on global knowledge sourcing and that technological capability of an overseas R&D subsidiary strengthens the relationship between autonomy and global knowledge sourcing.

3.1. Introduction

Under the intense competition in the global knowledge-based economy, multinational corporations (MNCs) have increased their overseas R&D investment from 1990s because knowledge has become one of the most important components of competitive advantage (Grant 1996). Therefore, the proportion of MNCs' global R&D expenditure and knowledge flows within MNCs' global R&D networks have experienced an upsurge since 1990s (Miao, Choe, & Song, 2011). Knowledge flows from an overseas R&D subsidiary to both the parent company and to its peer subsidiaries have contributed to the MNC's learning from all over the world. According to OECD database (2015), the degree of globalization of R&D of MNCs which is measured by various indicators, such as the proportion of R&D expenditure and patent application from abroad, has increased persistently in most of the large R&D intensive industries. As MNCs has recognized the importance of global R&D, the nature of overseas R&D activities of MNCs has also substantially evolved. Traditionally, an overseas R&D subsidiary plays a role as "home-base exploiting (HBE)." However, the role of an overseas R&D subsidiary has recently changed to "home-base augmenting (HBA)" one by sourcing and exploring new knowledge

in the host country or other countries, neither home nor host country, with its cooperation partners from diverse countries (Asakawa, 2001; Birkinshaw, Hood, & Jonsson, 1998; Cantwell & Mudambi, 2005, Kuemmerle, 1999). Because valuable knowledge is implicit and not easy to transfer across boundaries (Almeida, 1996), knowledge flows within organizational boundary and geographical boundary are substantially different from knowledge flows across organizational and geographical boundaries. Therefore, distribution of specific knowledge tends to be locally bounded (Jaffe, Trajtenberg, & Henderson, 1993). Thus, despite this local biased knowledge distribution, how MNCs source and transfer knowledge within MNCs' geographically dispersed network have been one of the most popular topics for strategy and international management researchers. Especially, prior researches have focused on how to overcome this barrier to transfer knowledge among organizations and countries. Establishment of overseas R&D laboratories, external collaboration with partners from other countries, and engineer mobility contribute to MNCs' global learning (Asakawa, Park, Song, & Kim, 2015; Miao, Choe, & Song, 2011; Song, Almeida, & Wu, 2003).

As MNCs has increased their global R&D efforts and expanded the roles of their overseas R&D subsidiaries, both

academic scholars and practitioners have given more attention to globalization of R&D activities of MNCs (Song, Asakawa, & Chu, 2011). However, previous literatures related to this topic have only focused on macro influencing factors, such as economic environment and government policy. They have under-estimated micro factors such as member's motivation and attitudes. Therefore, this stream of researches fails to offer useful insight about how to manage overseas R&D activities of MNCs to source knowledge from all over the world for global innovation.

As a local unit of multinational corporation's global network, an overseas R&D subsidiary shares and sources knowledge from both home and host countries and from both the MNC and other organizations (Bartlett & Ghoshal, 1989). Furthermore, more and more overseas R&D subsidiaries of MNCs engage in innovation not just for the local market, but also for the global market (Asakawa, Park, Song, & Kim, 2015). As the importance of an overseas R&D subsidiary in MNC innovation increases, its knowledge sourcing behaviors for innovation has evolved over time as well. Subsidiaries can assimilate knowledge from multiple sources within and outside the MNC across geographical boundaries (Phene & Almeida, 2008). They can source knowledge from the subsidiaries themselves, from MNC headquarters, and from other subsidiaries within the same

MNCs. Outside the firm boundaries, they can source knowledge from other organizations in the home country, from other organizations in the host country, and from other organizations in other countries, neither home nor host country. Then, they can utilize these diverse knowledge to explore and innovate not only for the local market but also for the global market (Phene & Almeida, 2008; Venaik, Midgley, & Devinney, 2005). However, despite growing trend in global knowledge sourcing by overseas R&D subsidiaries, prior researches have primarily focused on factors related to local knowledge sourcing of overseas R&D subsidiaries (Ambos, Ambos, & Schlegelmilch, 2006; Frost & Zhou, 2005; Song, Asakawa, & Chu, 2011). The purpose of this research is to fill a gap in the literature in the field of global R&D and knowledge management by shedding new light on the micro level determinants of overseas R&D subsidiaries' global knowledge sourcing with social identity perspective.

Organizational identities show the room for potentially interesting avenues of innovation and creativity (Kogut & Zander, 1996). Especially, overseas R&D subsidiaries of multinational corporations within complex social and knowledge context can identify with multiple targets. The members of an overseas R&D subsidiary can identify more with home country based on the notion

that they are the unit of the multinational corporation. Or as a local unit located in the host country, they can identify themselves more with the local knowledge sharing community. Otherwise, an overseas R&D subsidiary can identify itself with the global community. According to social identity theory, an overseas R&D subsidiary can change its attitudes and behaviors for identity congruence to enhance its self-esteem or to reduce uncertainty. Thus, in this perspective, organizational identification of an overseas R&D subsidiary with global community can help its global knowledge sourcing which is more difficult and risky work than others due to localized characteristics of knowledge flows. Therefore, in this study, by combining organizational theory such as social identity theory and social psychology and knowledge/innovation related literatures in the field of strategic management and international management, I examine the factors related to global identity of an overseas R&D subsidiary and their impact on its global knowledge sourcing empirically. I would address the question ‘how does global organizational identity of an overseas R&D subsidiary affect its knowledge sourcing from global which means sourcing knowledge from other countries, neither home nor host country?’

Based on social identity theory, I hypothesized that an overseas R&D subsidiary is more likely to source knowledge from other countries (global knowledge sourcing) when it has clear mission as global innovator; when it is more autonomous; and when it is more deeply embedded in the relationship with the global partners. And I also expected that strong technological capability of an overseas R&D subsidiary can strengthen the positive relationship between its global identity and its global knowledge sourcing due to confidence and diagnosticity. To empirically test suggested hypotheses, I used data of 41 overseas R&D laboratories of 24 Japanese multinational corporations. Using combinative data with the extensive survey and patent data from the U.S. patent database, the statistical analysis of 617 patents from 41 overseas R&D laboratories with negative binomial regression model shows that an overseas R&D laboratory with high autonomy and global embeddedness in the relationships with its global partners is more likely to source knowledge from global than others. And the empirical result also shows that technological capability of an overseas R&D subsidiary strengthens the positive relationship between its autonomy and global knowledge sourcing.

The rest section of this paper is organized as follows. The following section presents the theory related to the determinants of

global knowledge sourcing by overseas R&D subsidiaries with the lens of social identity and identity congruence. Then, based on social identity theory and social psychological argument, I hypothesized the relationship between global identity related constructs and global knowledge sourcing behaviors of overseas R&D subsidiaries and the moderating effect of technological capability on this relationship. And methodology, findings from empirical analysis by negative binomial regression, and conclusion sections follow.

3.2. Theory and Hypotheses

3.2.1. Organizational identity and behaviors of organizational members: Social identity theory

Researchers concerning organizational identity have given increasing attention over the past decades, even though organizational identity is not a brand-new construct in the field of organization researches (Ashforth & Mael, 1989; Albert, Ashforth & Dutton, 2000). Identity also becomes more and more powerful term in strategy literatures to explain organization behaviors. An identity is defined as “those features of an organization that in the

eyes of its members are central to the organization's character or self-image, make the organization distinctive from other similar organizations, and are viewed as having continuity over time.” (Albert & Whetten, 1985; Gioia, Patvardhan, Hamilton & Corley, 2013: 125). A general and famous definition of organizational identification is ‘a perceived oneness or belongingness with an organization,’ ‘who we are as an organization’ and ‘the experience of the organization's successes and failures as one's own.’ (Mael & Ashforth, 1992; Gioia, Patvardhan, Hamilton & Corley, 2013).

By offering a social-psychological perspective Social identity theory (SIT) suggests useful applications to organizational behaviors (Ashforth & Mael, 1989; Ellemers & Haslam, 2012). Based on early work developed by Tajfel and Turner (Tajfel, 1978; Tajfel, 1981; Tajfel & Turner, 1985; Turner, 1975, 1982, 1984, 1985), Social identity theory argues that a person tends to classify or categorize both himself/herself and others into specific group or category which is socially defined by prototypical characteristics from members of that categories (Tajfel & Turner, 1985; Turner, 1985; Vora & Kostova, 2007). Social psychological lens helps researchers of social identity theory define social identity as “part of an individual's self-concept which derives from his/her knowledge of his/her membership of a social group/ groups together

with the emotional significance attached to that membership” (Tajfel, 1974: 69; Ellemers & Haslam, 2012). And they explain that the underlying motivation for identification of a person with a group is the need to enhance his/her self-esteem and this motive becomes in-group favoritism (Vora & Kostova, 2007). This leads a person to differentiate positively his/her group from other groups to enhance their self-esteem.

The most basic question of self-categorization theory is how separate individuals are clustered into groups. According to social categorization theory, as an extension of social identity theory, a person’s places in society are defined by his/her social categorizations and value internalization and emotional attachment of a person into his/her group provide social identity (Turner & Reynolds, 2012). The motive for positive distinctiveness and the need to reduce uncertainty leads a person to be more favorable to in-group through social comparison under certain conditions and to adopt salient group characteristics (Vora & Kostova, 2007).

Organizational identification, as a specific case of group identification, occurs when a member of an organization defines himself or herself in terms of the organization. He or she adopts the defining characteristics of the organization as defining characteristics of himself or herself. And, he or she personalizes

the organization's successes or failures as his or her own (Dutton, Dukerich & Harquail, 1994; Mael & Ashforth, 1992). The need for self-enhancement and uncertainty reduction are regarded as the main motivations for people to identify themselves into organizations (Hogg & Terry, 2000; Vora & Kostova, 2007). Therefore, when a person identifies himself or herself, he or she tends to show in-group favoritism and out-group discrimination. Furthermore, he or she would show high commitment for his or her organization because he or she internalizes his or her organization's successes or failures (Turner & Oakes, 1997; Haslam, 2001).

Members become aware of the gap between perceptions regarding "who I am" and "who we are" through identity comparison process and this gap make people desire to reduce this cognitive dissonance (Foreman & Whetten, 2002). Member's attitudes and behaviors such as internalization, cooperation, and acceptance of change are shaped by this desire to congruent. Some prior literatures mentioned that organizational identity is one of the most important ingredients of organizational cohesion and success in dispersed and complex organizations such as multinational corporations (Reade, 2001).

3.2.2. Global organizational identity and global knowledge

sourcing of an overseas R&D subsidiary

Organizational identity and Knowledge

Although organizational identity and knowledge represent very fundamental in organizational studies, relationship between these two concepts has been under investigated previously (Nag, Corley, & Gioia, 2007). Some researchers mentioned about the utility of conceptual link between organizational identity and knowledge (Brown & Duguid, 2001; Kogut & Zander, 1996). However, business literatures related to these two constructs have gone another way in spite of interlink between them. Knowledge and organizational identity are inter-related and collectively manifested as attitudes and behaviors of organization members. Their knowledge both influenced and were influenced by their collective thinking of who they were as an organization (Nag, Corley, & Gioia, 2007). In this study, I try to demonstrate the applicability of this organizational identity construct to knowledge related behaviors by employing these concepts and related arguments to global identity and global knowledge sourcing of overseas R&D subsidiaries.

Global knowledge sourcing of an overseas R&D subsidiary

More and more overseas subsidiaries of MNCs engage in

innovation for the local market. Furthermore, some of them started to shift their focus from innovation for the local market to innovation for the global market (Nobel & Birkinshaw, 1998; Singh, 2005; Cantwell & Mudambi, 2005), as globalization of R&D has increased substantially (Gerybadze & Reger, 1999; Zander, 1994; Gassmann & von Zedtwitz, 1999). Thus, the role of an overseas R&D subsidiary has evolved from exploitation-based role to exploration-based role (Ambos, Ambos, & Schlegelmilch, 2006; Asakawa, 2001; Birkinshaw, Hood, & Jonsson, 1998; Cantwell & Mudambi, 2005; Frost, Birkinshaw, & Ensign, 2002; Kuemmerle, 1999; Makino, Lau, & Yeh, 2002).

Corresponding to this role evolution of an overseas R&D subsidiary, its knowledge sourcing patterns also has evolved (Asakawa, Park, Song, & Kim, 2015). As a newly established local unit of a multinational corporation, an overseas R&D subsidiary traditionally has acquired knowledge from its parent organization and from home country (Ronstadt, 1977). Especially, a MNC headquarter has been the main source of knowledge for an overseas R&D subsidiary. However, the main motivation of overseas R&D operation has changed from home base knowledge exploitation for the local market to knowledge exploration from the host country and from other countries (Bartlett & Ghoshal, 1989; Song, Asakawa,

& Chu, 2011). As time goes by, an overseas R&D subsidiary begins to source knowledge from anywhere in the globe, regardless of its original location, while it engages in innovation for the global market (Doz, Santos, & Williamson, 2001). In spite of growing trend, what are the determinants of an overseas R&D subsidiary's global knowledge sourcing has been under-investigated (Asakawa, Park, Song, & Kim, 2015).

Global organizational identity and global knowledge sourcing of an overseas R&D subsidiary

While globalization is likely to be one of the dominant forces in the psychological development of the people of the 21st century (Arnett, 2002), people develop a sense of belongingness to worldwide, by adopting practices, styles, and information that are part of the global (Arnett, 2002; Erez & Cati, 2004). This is the general definition of global identity. Global identification moves beyond the sense of belonging to any one particular nation (Westjohn, Arnold, Magnusson, Zdravkovic, & Zhou, 2009). Individuals who identify with a global community recognize that the world is much bigger than their own home country, and are likely to be more open to new ideas and broaden their search for products and services beyond their local community. Thus, global identity can form people's attitudes and behaviors to new knowledge or

technology. They become more optimistic and innovative and feel comfort and secure with new technology when they have global self-identity (Parasuraman, 2000; Westjohn, Arnold, Magnusson, Zdravkovic, & Zhou, 2009).

Due to the localized nature of tacit knowledge and absence of social capital, it is challenging to access knowledge from a distance (Doz & Wilson, 2012). Deficiency of absorptive capacity and interaction with others makes global knowledge sourcing risky and uncertain. As I mentioned at study I, the members of a subsidiary can identify with their multinational corporation (home-base) or with their local community (host country-base) under dual organizational identity context. Because the members fulfill the needs for enhancement in self-esteem and reduction in their uncertainty by identity congruence, they regard global knowledge sourcing as too risky option to seek knowledge. Therefore, it is not easy to source knowledge from other countries, neither home nor host country. To enhance global knowledge sourcing, it is essential to explore which factors can form the global identity and how these motivational determinants positively affect on global knowledge sourcing. Based on organizational identity related literatures, I develop three hypotheses about organizational level antecedents to global organization identity and global knowledge sourcing of

overseas R&D subsidiaries. I focus on the mission, autonomy, and global embeddedness of an overseas R&D subsidiary in this section.

Mission and global knowledge sourcing of overseas R&D subsidiaries Organizational distinctiveness differentiates the organization from other organizations. This provides a sharper and more salient definition for organizational members, thereby attract a passionate following of members (Mael & Ashforth, 1992). Mission /mandate of a subsidiary has been defined as any subsidiary responsibility that extends beyond its tasks (Birkinshaw, 1996). While members enact with their organizational identity, they attempt to live up the ideals embodied in the organization's mission and values (Ashforth, Harrison, & Corley, 2008). People may feel their works is rewarding when these works are consistent with the mission/ mandate of their organization.

Prior literatures have suggested three mutually exclusive missions of an overseas R&D subsidiary. They are localization, innovation for local market, and innovation for global market. When the mission of an overseas R&D subsidiary is simple globalization, it would interact and receive knowledge from MNC, especially from MNC HQ located in home country. Whereas, if an overseas R&D subsidiary has local innovation mandates, it has incentive to interact with local community and favor local knowledge sourcing. Also,

stronger identification with the subsidiary as local unit by local innovator mission make members identified with the subsidiary more strongly than with the MNC. On the other hand, when an overseas R&D subsidiary's mission is global innovation, the members of this subsidiary show a different attitudes and behaviors. Stronger identification as global innovator makes members of the subsidiary open to knowledge from anywhere all over the world. If the members identify themselves as global innovator strongly, to fulfill self-enhancement and uncertainty reduction, they will favor knowledge from global than knowledge from home or host country. In this case, members are more likely to source knowledge from other countries than from home or host countries.

Hence, I hypothesized:

H1 An overseas R&D subsidiary is more likely to source knowledge from other countries when it has clear and distinctive mission as global innovator.

Autonomy and global knowledge sourcing Intellectual autonomy encourages individuals to pursue their own ideas and intellectual directions independently (Inglehart & Oyserman, 2004). Ishii (2012) argued that autonomy appeared to be important to

develop and maintain identification with a particular independent entity. Subsidiaries with high autonomy in terms of both decision-making and resources generate their own knowledge and respond to the market. Identifying with such a distinctive and independent subsidiary helps to fulfill their need for a positive self-esteem and uncertainty reduction (Vora & Kostova, 2007).

When members of an overseas R&D subsidiary have autonomy, they can identify with the global community than with its parent corporation or with local community. Stronger identification with the subsidiary as a member of global community make inventors favor things in all over the globe, regardless of geographic orientation. And inventors will become more open to the global community and ideas of distant locations. Thereby, members of overseas R&D subsidiaries will source more knowledge from other countries, neither home nor host country, when their subsidiaries have high level of autonomy.

Hence, I hypothesized:

H2 An overseas R&D subsidiary is more likely to source knowledge from other countries when it is more autonomous.

Global embeddedness and global knowledge sourcing

Overseas subsidiaries can benefit from link to other organizations outside the MNC when they try to access to external knowledge (Asakawa, Park, Song, & Kim, 2015). Existing literatures suggested that collaboration of overseas subsidiaries with other organizations in other countries outside the MNC can leads to innovation because it increases the breadth and depth of knowledge from outside (Un, Cuervo-Cazzura, & Asakawa, 2010). This logic can be extended to the context of global knowledge sourcing of overseas R&D subsidiaries through collaboration with partners located in distant area. By forming direct links with global partners, an overseas R&D subsidiary can access the extensive knowledge they are looking for without relying on MNC network and local community.

Furthermore, frequent exposures to the global work environment by collaborating partners located in all over the world can help to shape a global identity of overseas R&D subsidiaries (Erez & Cati, 2004). The global identity becomes salient in a global context, enabling individuals to adapt to their global group and increased involvement with global team leads to increased acceptance of global group identity (Erez, Lisak, Harush, Glikson, Nouri, & Shokef, 2013). Stronger identification as a member of global community by interaction with partners can change inventors' attitudes and behaviors related to source knowledge from global. To

enhance self-esteem and to reduce uncertainty, the members who identify more with global community will pursue global identity congruent behaviors. Thus, for self-enhancement and uncertainty reduction with identity congruent behaviors, members of overseas R&D subsidiaries will have strong motivation to source more knowledge from other countries, neither home nor host country, when their overseas R&D subsidiary are more deeply embedded in the global community by close relationships and frequent interactions with their global partners.

Hence, I hypothesized:

H3 An overseas R&D subsidiary is more likely to source knowledge from other countries when it is more deeply embedded in the relationships with global partners.

3.2.3. Technological capability, global organizational identity and global knowledge sourcing of an overseas R&D subsidiary

To absorb valuable knowledge located in external sources, an organization must possess prior knowledge base in related technological areas. Through this knowledge base it can identify, assimilate, and acquire external knowledge. Cohen and

Levinthal(1990) defined this as absorptive capacity. Researches on knowledge sourcing of MNC based on absorptive capacity view suggested that international R&D activities of MNCs benefit from existing technological capabilities of subsidiaries and headquarters of MNCs. This view implies that an overseas R&D subsidiary with strong technological capabilities can source more knowledge from home, host and other countries (Song, Asakawa, & Chu, 2011).

Technological capabilities of an overseas R&D subsidiary have not only direct impact on local and global knowledge sourcing but also indirect effect on the relationship between its global identity and global knowledge sourcing. Knowledge sourcing from other countries is riskier than that from home country or that from host country. By the way, the decision makers can take more risks when they are more confident (Chatterjee & Hambrick, 2011). With his/her sense of confidence, a member of the organization can expect more fruits from risky initiatives when this organization has strong capabilities. Similarly, the members of an overseas R&D subsidiary expect more benefits from risky but global identity congruent behaviors; global knowledge sourcing when they are more confident because an overseas R&D subsidiary has strong technological capabilities. Therefore, strong technological capability of an overseas R&D subsidiary can strengthen the relationship

between the antecedents of global identity and global knowledge sourcing.

In addition, more positive evaluations about knowledge from global can be induced when global identity is more accessible and more diagnosable (Zhang & Khare, 2009). Individuals tend to more favorably respond to stimulus which is consistent with specific identity when this identity is more salient, accessible and diagnosable. Stronger identity-consistent responses can be induced by an accessible self-identity when this self-identity is more diagnostic (Reed & Forehand, 2009). Similarly, an overseas R&D subsidiary with strong technological capabilities can explore knowledge beyond the geographical boundary (Nobel and Birkinshaw, 1998; Singh, 2005; Song, Asakawa, & Chu, 2011) and through these capabilities its members can easily identify which option is stronger identity-consistent response than other options. Thus, strong technological capabilities of an overseas R&D subsidiary will strengthen the relationship between global identity and global knowledge sourcing as global identity congruent behavior of an overseas R&D subsidiary.

Hence, I hypothesized:

H4 A positive relationship between global identity and global

knowledge sourcing of an overseas R&D subsidiary will be strengthened when an overseas R&D subsidiary has stronger technological capability.

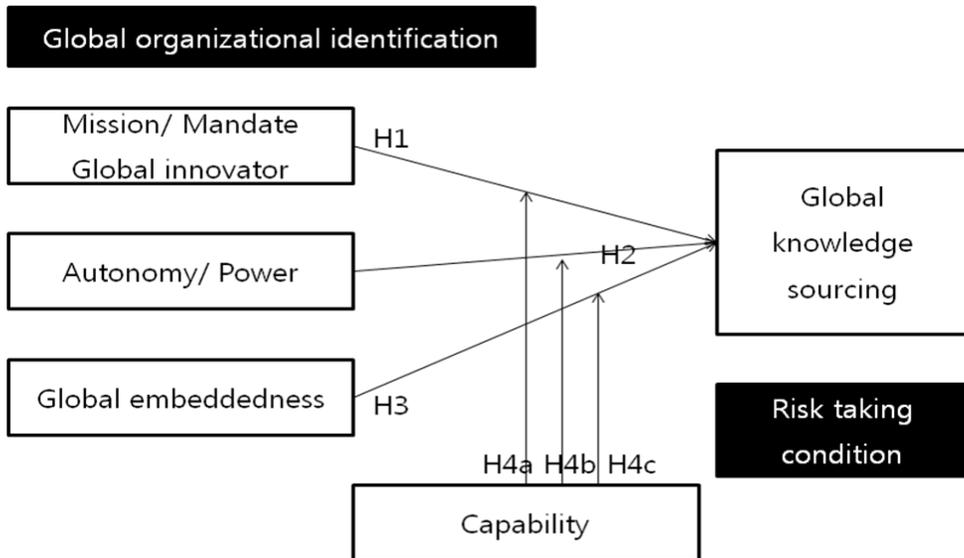
H4a (Mission) A positive relationship between global innovator mission and global knowledge sourcing of an overseas R&D subsidiary will be strengthened when an overseas R&D subsidiary has stronger technological capability.

H4b (Autonomy) A positive relationship between autonomy and global knowledge sourcing of an overseas R&D subsidiary will be strengthened when an overseas R&D subsidiary has stronger technological capability.

H4c (Global embeddedness) A positive relationship between global embeddedness and global knowledge sourcing of an overseas R&D subsidiary will be strengthened when an overseas R&D subsidiary has stronger technological capability.

[Figure 3–1] summarizes the hypotheses suggested above.

[Figure 3-1] Research model



3.3. Methods

3.3.1. Data and Sample

To test hypotheses related to the relationship between global identity and global knowledge sourcing of overseas R&D subsidiaries of multinational corporations empirically, I need not only data about characteristics and capabilities of subsidiaries but also data related to innovations of overseas subsidiaries and knowledge base of them. Therefore, in this paper, I combined data from multiple sources, survey data from responses of Japanese multinationals' overseas R&D laboratories to survey questionnaires and patent issue and citation data from U.S. Patent & Trademark Office (USPTO) database. Asakawa, one of my co-author in other paper, conducted the extensive survey about characteristics and knowledge-related behaviors of overseas R&D laboratories of Japanese multinational corporations.

The sample of this paper derived from the sample of the survey of Asakawa. The sample subsidiary list was selected by the survey conductor based on the list from [Overseas Japanese companies] which is published by Toyo Keizai every year. Overseas Japanese companies database is one of the largest

database about Japanese company' s overseas expansion and foreign operations based on Toyo Keizai' s annual survey for 40 years. The survey conductor made a list of 497 overseas R&D subsidiaries of Japanese multinationals from the database at first and mailed the extensive survey questionnaires to the overseas R&D subsidiaries in the list. In total, 102 out of 497 subsidiaries participated in the survey, with the response rate of 21% and of which, 99 responses turned out to be effective, with the effective response rate of 20%.

The survey responses from 99 overseas R&D labs of 62 major Japanese multinational corporations were included in the sample. Because I focus on the relationship between global identity– related characteristics of overseas R&D subsidiaries and their knowledge sourcing direction, the subsidiaries which did not apply and issue patents were have to be separate from the sample of this piece. I only included labs which applied and registered patents successfully in the U.S. Patent and Trademark Office (USPTO) between 2001 and 2006 because the survey questionnaire asked about the characteristics of an overseas subsidiary of year 2000.

Data on overseas R&D labs which responded to the survey and patents from 2001 to 2006 were collected. To measure

independent variables and control variables of my research, I used the survey response data. And patent data from the USPTO patent database were used to construct my dependent variable, the magnitude of knowledge sourcing of an overseas R&D subsidiary from the other countries (neither home nor host country of an overseas R&D subsidiary). Over the past decades patent data have become one of the most popular indicators of knowledge flow and creation for the organization researchers (Hall, Jaffe, & Tranjteberg, 2000). USPTO have released patent documents through patent database. The documents offer general and specific information about patents, such as the patent title, technology type and claims, the name of assignees and inventors, and the geographical residence of assignees and inventors, reference/citation information. To identify innovation and chase knowledge flow related to innovation of the sample, I need to collect these kinds of information about the patents which was applied and registered by overseas R&D subsidiaries of Japanese multinational corporations for the empirical analysis. As a way to capture knowledge flows, USPTO patent database reference/citation information has been used frequently (Almeida, 1996: Jaffe, & Tranjteberg, 2002; Singh, 2004; Song et al., 2003). Because flows of knowledge between individuals or organizations are not visible, it is not easy to trace

them. Furthermore, it is hard to identify how these knowledge flows become one of the knowledge bases of the specific invention. Because patent citation information gives us a clue of ‘how a new piece of technological knowledge builds on existing knowledge (Singh, 2005: 759),’ researchers have used this frequently to measure knowledge and innovation related variables.

The patent citation list for each patent shows which prior inventions (patents) provided a foundation for the new inventions. For instance, if patent A was cited by patent B, this means patent B was built on knowledge base embodied in patent A. Therefore, it is possible to infer significant influences on a particular invention and to track knowledge building across individuals, organizations, and geographic boundaries through patent citation information. Though the use of patents and patent citation data as measures of knowledge flow has not only advantages but also some drawbacks, prior studies show a high correlation between patent citations and actual knowledge flows by comparing patent data and survey data (Jaffe & Trajtenberg, 2002).

Thus, following the protocol of prior literatures, in this study, I also used backward patent citation data to capture knowledge flows from other countries (neither home nor host country) to overseas R&D subsidiaries to measure global

knowledge sourcing of them. Because it is almost impossible to measure invisible knowledge flows without USPTO patent citation data, I need to exclude overseas R&D subsidiaries who did not apply and register USPTO patents from the empirical sample. Due to the time point of the survey data (2000), I decided to allow a time lag of at least one year from the time point of the survey data (2000) and utilized patent data from 2001 to 2006 in order to allow for time spent completing research projects and patent application processes. Due to the potential bias from fluctuations by time period, I decided to limit our observation period to six years. As a result, our sample included 617 patents from 41 overseas subsidiaries of 24 major Japanese MNCs. The geographic distribution and industry classification of our sample subsidiaries are shown in [Table 3-1] and [Table 3-2]

[Table 3-1] Distribution of overseas R&D subsidiaries by host country

Country	Number of subsidiaries in our sample
USA	21
Germany	6
Great Britain	6
France	2
Australia	2
China	2
Others	2
Total	41

[Table 3-2] Classification of overseas R&D subsidiaries by industry

Industry	Number of subsidiaries in our sample
Chemical	6
Pharmaceutical	6
Steel	1
Machinery	0
Electronics	12
Automobile	8
Precision	1
Telecommunication	7
Others	13
Total	54

(The number of subsidiary = 41, The number of industry count is 54 because I allowed multiple industry choice in the survey.)

Comparing to multinational corporations from USA and West European countries, Japanese multinational corporations were later comer of global R&D operations. However, they have increased their global R&D investment and persistently have innovated with knowledge from geographically diverse sources (Asakawa, 2001; METI, 2005, 2013; Song, Asakawa, and Chu, 2011). Therefore, overseas R&D subsidiaries from Japanese MNCs are one of the great samples for the study related to knowledge sourcing and innovation.

2. 3. 2. Variables and measures

The dependent variable: *Global knowledge sourcing*

The dependent variable of this paper, the magnitude of global knowledge sourcing of overseas R&D subsidiaries of Japanese MNCs, was measured at the patent level. Global knowledge sourcing is defined as knowledge sourcing from countries other than the home or host countries of overseas R&D subsidiaries. I measured the dependent variable of this paper, global knowledge sourcing of an overseas R&D subsidiary, as the number of backward citations made by each patent to any patent applied for by assignees or inventors who resided in other countries. First, to

construct my dependent variable, I needed to identify patents applied for by overseas R&D subsidiaries in the sample. I searched the USPTO patent database by subsidiary or MNC name and then verified the patents of my sample subsidiaries by using the location information of the assignee and inventors of the patents. Then, to identify knowledge sources, I had to collect more detailed information, such as the names and locations of assignees and inventors of patents which were cited by the patents of overseas R&D subsidiaries in the sample. After acquiring, matching and merging these citation-related data, I divided and counted the number of citations by source. An increase in this count measure indicates an increase in the degree to which a patent is based on knowledge from other countries, neither the home nor host country, of overseas R&D subsidiaries of Japanese MNCs.

Independent variables and moderating variables

Mission/mandate as global innovator I used survey items related to the mission of an overseas R&D laboratory to identify the mission as global innovator. I coded 1 for ‘innovation for the global market’ as the mission of the lab and coded 0 for other answers.

Autonomy As the role of overseas R&D subsidiaries has evolved, the degree of autonomy has been a major issue in the coordination

and control of global R&D (Behrman & Fischer, 1980; Meyer & Mizushima, 1989). For effective innovation, R&D centers must enjoy a high level of autonomy. A survey item was crafted regarding freedom of decision-making related to operations of overseas R&D laboratories, such as selection of research projects and publication, recruitment of inventors, and performance appraisal. After factor analysis, selected items were used to construct an index.

Linkage with global partners A measure of linkage with global partners was also computed by constructing a composite index based on the survey. The survey included questions about the frequency of collaborations with organizations located in other countries, excluding the home or the host country, outside MNC, such as universities and venture firms. As I did for other independent or control variables, I selected items and computed values based on the results of the factor analysis.

Capability of subsidiary Technological capabilities directly impact knowledge- and innovation-related behaviors of overseas R&D subsidiaries. According to Cohen and Levinthal (1990: 128), absorptive capacity is the “ability to recognize the value of new external information, assimilate it, and apply it to commercial ends.” Song and Shin (2008) pointed out that technological capabilities of

subsidiaries and HQ can affect acquisition of knowledge sourced from host countries. And, I suggested that technological capabilities of subsidiaries will strengthen the relationship between global identity and global knowledge sourcing. Therefore, I included the technological capabilities of subsidiaries in the model. To measure technological capabilities of an overseas R&D laboratory of my sample, I built composite indices based on the results of the factor analysis of survey items related to the capabilities of each R&D unit. Respondents also answered questions associated with their degree of understanding of technology trends and absorption of new science and technologies.

Control variables

To capture the pure effects of suggested independent variables on global knowledge sourcing, I included control variables based on patent data and the survey results. At the patent level, I introduced two control variables; Number of citation and MNC citation.

Number of citation Since the total number of citations made by a patent in the sample of this study directly influences the extent of citations to the other countries' patents, it must be controlled. I counted the total numbers of citations for each patent and included

them as control variable.

MNC citation Because path-dependent technologies may manifest a sense of self-sufficiency and inertia (Nelson & Winter, 1982; Kim & Song, 2007), the number of self-citation should be controlled. Therefore, I also counted and controlled for the number of citations of each patent to prior patents of sample MNCs.

I also included four subsidiary-level control variables; Industry dummy, Collaboration with MNC headquarter, Collaboration with other subsidiaries within the same MNC, and MNC HQ's capability.

Industry dummy I coded 1 for 'chemical/ pharmaceutical' as an industry and coded 0 for other answers.

Collaboration with HQ The degree of embeddedness in the MNC's global network influences the innovative capacity of overseas R&D subsidiaries because knowledge sharing and transferring between subsidiaries and MNC HQ occur when they embedded in the relationship within MNCs (Asakawa, Park, Song & Kim, 2015). The degree of collaboration with MNC headquarter was computed by constructing a composite index based on the survey. I extracted some survey items associated with knowledge-related/ technological interaction between an overseas R&D lab and MNC HQ based on the results from factor analysis and Cronbach' s alpha

test. The survey included questions regarding frequency of knowledge-related/ technological interaction, such as joint research projects, transfer of technology/ knowledge, and movement of researchers and engineers. Based on the value measured by five point Likert scale, I made a composite index about internal embeddedness by computing average.

Collaboration with other subs The degree of linkage with other subsidiaries within the same MNC was computed in the similar way to measure collaboration with MNC HQ. From the survey, I selected items about the relationship of an overseas R&D lab with other overseas R&D units within the MNC. Based on the values measured by the frequency of joint research projects, transfer of technology/ knowledge, and movement of researchers and engineers between two R&D units within MNC, I made a composite index for measurement of the degree of collaboration with other subsidiaries by computing average score of items.

MNC HQ's capability To measure technological capabilities of each MNC headquarter, I built composite indices based on the results of the factor analysis of survey items related to the capabilities of each R&D unit. Survey respondents answered questions associated with HQ' s degree of understanding of technology trends and absorption of new science and technologies.

Statistical analysis model

I employed negative binomial regression analysis to investigate factors, related to global identity of the subsidiary, influencing the magnitude of global knowledge sourcing because the dependent variable of this piece, global knowledge sourcing, was measured by the number of backward citations to the patent applied by assignees or inventors who resided in other countries (neither the home nor host country). I could not use subsidiaries as the unit of analysis due to the limited sample size. Thus, the unit of analysis in this empirical test was the number of individual patents granted to the 41 overseas R&D subsidiaries that were applied for in the USPTO database from 2001 to 2006. I clustered standard errors by overseas R&D subsidiaries, since this data included multiple observations for each subsidiary.

By using negative binomial regression models, I avoided the over-dispersion problem in my data structure. As an extension of Poisson regression, a negative binomial regression properly estimates count variables with over-dispersion. In the negative binomial regression models, the probability that the number of patent citations will occur n times (with $n = 0, 1, 2, \dots$) is as follows:

$$\text{Prob}(Y = y_j) = e^{-\lambda_j} \lambda_j^{y_j} / Y_j!$$

where $\lambda_j = \exp(\sum B_i X_{ij}) \exp(\mu_j)$, $e^{\mu_j} \sim \text{Gamma}(1/\alpha, 1/\alpha)$ for observed counts of patent citations Y_j with covariates X_i for the j th patent of an overseas R&D subsidiary i .

3.4. Results

3.4.1. Results of factor analysis and Cronbach' s alpha test

To construct independent variables, moderating variable and control variables of this paper, I extracted several items from the survey response data. Because I tried to examine the impact of influencing factors related to an overseas R&D subsidiary' s global identity of an overseas R&D subsidiary on its knowledge sourcing behavior and the moderating role of an overseas R&D subsidiary' s technological capability, all of variables were measured at subsidiary level.

The survey questionnaire contained questions about the characteristics of a subsidiary and the interactions among organizations, such as decision making, information exchange, research collaborations with MNC HQ or other subsidiaries. It also

included questions about the interaction with other firms or organizations such as universities and research institutes which were located in the host country or other countries. Each item of the survey was measured by the five point Likert scale. I provide more detailed explanation about each variables and the way to measure them below.

Because I used multiple items of the survey questionnaire to construct some independent variables, moderating variable and control variables, I identified the items used in each variable and tested the composite reliability of them before the statistical analysis. I conducted factor analysis and the Cronbach' s alpha test to build the construct and to check composite reliability. Composite reliability assesses the internal consistency of a measure which reflects the coherence of the components of a scale. Internal consistency is usually tested by Cronbach' s alpha in prior researches which used survey data. Based on the result of the factor analysis, I selected items to measure each construct and computed Cronbach' s alpha score of them. The results of Cronbach' s alpha test are displayed in [Table 3–3].

[Table 3-3] Cronbach's alpha scores of factors/survey items

Variables	Number of survey items	Cronbach's α
Collaboration with HQ	3	0.7241
Collaboration with other subs	3	0.7410
HQ's capability	4	0.9564
Sub's capability	4	0.7173
Autonomy	6	0.8255
Collaboration with global	2	0.6149

As you can see in [Table 3–2], all of Cronbach’ s alpha scores of variable items of this empirical study were significantly high with the lowest value in excess of 0.60 and the highest value over 0.95. Except for just one measure, all coefficient alpha of the scale exceeded the 0.70 level recommended by Nunnally (1978) and the lowest value was above 0.60, satisfactory level. Based on these results, I averaged selected item scores and used them for regression, because inter–item reliability was high enough to do so.

3.4.2. Descriptive statistics and correlations

The summary of descriptive statistics and correlation matrix of the variables are presented in [Table 3–4] and [Table 3–5]. The correlation matrix shows no significant high collinearity among the variables, except for the total number of citations in my research model. Therefore, I included all variables in the negative binomial regressions models.

[Table 3-4] Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Global sourcing	617	3.005	4.379	0	53
Number of citation	617	10.874	17.326	1	290
MNC citation	617	0.924	1.883	0	14
Industry	617	0.190	0.392	0	1
Collaboration with HQ	617	2.814	0.799	1.00	4.00
Collaboration with other subs	617	1.522	0.581	1.00	3.33
HQ's capability	617	3.440	0.800	1.00	5.00
Sub's capability	617	3.180	0.546	1.00	4.75
Mission as Global	617	0.230	0.421	0	1
Autonomy	617	4.125	0.702	1.00	5.00
Collaboration with global	617	1.073	0.266	1.00	3.00

[Table 3-5] Correlation matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
V1 Global sourcing	1.000										
V2 Number of citation	0.739*	1.000									
V3 MNC citation	0.274*	0.430*	1.000								
V4 industry	0.138*	-0.044	0.077	1.000							
V5 Collaboration with HQ	-0.093*	0.080*	-0.048	-0.466*	1.000						
V6 Collaboration with other subs	0.037	-0.070	0.017	0.467*	-0.493*	1.000					
V7 HQ's capability	-0.112*	0.060	-0.042	-0.605*	0.512*	-0.447*	1.000				
V8 Sub's capability	0.166*	0.001	0.025	0.100*	-0.508*	0.409*	-0.176*	1.000			
V9 Mission as Global	0.142*	-0.070	0.006	0.669*	-0.391*	0.375*	-0.547*	0.178*	1.000		
V10 Autonomy	0.190*	-0.048	-0.029	0.053	-0.318*	0.311*	-0.283*	0.290*	0.364*	1.000	
V11 Collaboration with global	0.048	-0.001	-0.086*	-0.008	0.031	0.040	-0.159*	0.013	-0.092*	-0.371*	1.000

(* if $p < 0.05$)

3.4.3. Results of negative binomial regression

[Table 3–6] presents the statistical findings from the negative binomial regressions. The table includes statistics of four models: the baseline model with control variables (model I), the model with independent variables (model II), and the model with moderating variables (model III), and the full model (model IV). Due to possible high correlation among interaction terms, I divided the model with moderating variables (model III) into three models. The chi-squared statistics for each model that included independent and moderating variables improved statistically significantly ($p < 0.01$) from the baseline model.

Model I represents the results of the base model including control variables only. The coefficients of the number of citation are significant ($p < 0.01$) and positive. The coefficients of other control variables are not statistically significant.

I added independent variables to the baseline model to find empirical evidence for my arguments related to global identity and global knowledge sourcing. I put three independent variables (Mission as global innovator, Autonomy and Collaboration with global partner) and subsidiary's capability into the model. This model (model II) shows that most of my main hypotheses

associated with the relationship between global identity and global knowledge sourcing of overseas R&D subsidiaries are supported statistically. The Chi-square difference between model I and model II is 51.67 and it was statistically significant at $p < 0.01$. The coefficient of Autonomy is positive and highly significant ($p < 0.01$). This finding supports hypothesis 2, suggesting that overseas R&D subsidiaries acquire more knowledge from global sources when they are more autonomous. On the other hand, the coefficient of Collaboration with global partner is significant ($p < 0.10$) and positive. This means that overseas R&D subsidiaries that collaborate with partners located in other countries (neither home nor host country) in knowledge-related activities are more frequently sourcing knowledge from global. Therefore, hypothesis 3 is also supported. However, the coefficient of Mission as global innovator is positive as I expected but not significant statistically. Therefore, unfortunately, hypothesis 1 was not supported by empirical analysis.

In model III, I empirically tested for the moderating effects of technological capability on the relationship between global identity and global knowledge sourcing of overseas R&D subsidiaries by including the interaction term. I suggested that technological capability of an overseas R&D subsidiary would

strengthen the positive relationships between Mission as global innovator (hypothesis 4a), Autonomy (hypothesis 4b) and Collaboration with global partner (hypothesis 4c) and global knowledge sourcing. As model III-2 shows, the coefficient of the interaction term between Autonomy and Capability of an overseas R&D subsidiary is positive and marginally significant at $p < 0.10$. Thus, hypothesis 4b is supported by the results of our statistical analysis, suggesting that a positive relationship between autonomy of overseas subsidiaries and their global knowledge sourcing would be strengthened when they have strong technological capability. However, hypothesis 4a (Mission X Capability) and hypothesis 4c (Collaboration with global partners X Capability) were not supported by empirical analysis. The coefficients of other interaction terms are not statistically significant and, against my expectation, the coefficient of interaction term between Mission and Capability was not positive.

[Table 3-6] Results of negative binomial regression with clustering option by subsidiaries (1)

	Model I	Model II	Model III-1
Control variables			
Number of citation	0.042 *** (0.013)	0.038 *** (0.010)	0.038 *** (0.010)
MNC citation	-0.077 (0.050)	-0.049 (0.039)	-0.050 (0.039)
Industry	0.373 (0.582)	0.878 * (0.475)	0.849 * (0.440)
Collaboration with HQ	-0.147 (0.261)	0.075 (0.207)	0.075 (0.206)
Collaboration with other subs	-0.087 (0.273)	-0.297 (0.250)	-0.311 (0.264)
HQ's capability	-0.137 (0.174)	0.107 (0.162)	0.122 (0.175)
Independent variables			
Sub's capability		0.269 (0.192)	0.284 (0.211)
Mission as Global innovator		0.065 (0.384)	1.164 (3.096)
Autonomy		0.634 *** (0.159)	0.636 *** (0.163)
Collaboration with global		0.497 * (0.272)	0.542 * (0.320)
Interaction terms			
Mission X Capability			-0.315 (0.876)
Autonomy X Capability			
Global collabo X Capability			
Cons	1.446 (1.203)	-3.864 *** (1.385)	-4.002 ** (1.582)
Chi-square	82.88 ***	134.55 ***	155.99 ***
d.f.	6	10	11

1) * if $p < 0.10$, ** if $p < 0.05$, *** if $p < 0.01$, 2) Standard errors in the parentheses

[Table 3-6] Results of negative binomial regression with clustering option by subsidiaries (2)

	Model III-2	Model III-3	Model IV
Control variables			
Number of citation	0.039 *** (0.011)	0.038 *** (0.010)	0.039 *** (0.011)
MNC citation	-0.046 (0.041)	-0.049 (0.039)	-0.047 (0.041)
Industry	0.805 * (0.483)	0.865 (0.535)	0.726 (0.493)
Collaboration with HQ	0.062 (0.199)	0.074 (0.207)	0.058 (0.197)
Collaboration with other subs	-0.225 (0.262)	-0.289 (0.305)	-0.219 (0.308)
HQ's capability	0.063 (0.187)	0.105 (0.163)	0.076 (0.195)
Independent variables			
Sub's capability	-2.782 (1.810)	0.175 (1.146)	-3.048 (1.894)
Mission as Global innovator	0.067 (0.393)	0.069 (0.390)	1.456 (3.458)
Autonomy	-1.575 (1.333)	0.626 *** (0.214)	-1.585 (1.344)
Collaboration with global	0.375 (0.316)	0.188 (3.510)	-0.601 (3.854)
Interaction terms			
Mission X Capability			-0.395 (0.975)
Autonomy X Capability	0.699 * (0.424)		0.694 (0.436)
Global collabo X Capability		0.091 (1.035)	0.304 (1.168)
Cons	5.903 (6.276)	-3.512 (4.470)	6.830 (6.606)
Chi-square	188.75 ***	157.45 ***	203.12 ***
d.f.	11	11	13

1) * if p<0.10, ** if p<0.05, *** if p<0.01, 2) Standard errors in the parentheses

3.5. Conclusions and Discussions

In this study, I try to fill the gap in the literature on R&D globalization and knowledge sourcing of MNCs by integrating social identity theory and social psychological explanation. First, I investigate the determinants of global knowledge sourcing in terms of the antecedents of global identity. Previously, most researchers in this field have focused on knowledge sourcing from MNC network and local area. In addition, since discussion of the relevance of motivational aspects in explaining knowledge sourcing from a geographically distant area is rare in literatures, there is room for the current research. Organizational identification and identity congruent behaviors of members to enhance their self-esteem and to reduce uncertainty can facilitate knowledge sourcing from other countries, neither home nor host country. Furthermore, I hypothesized and empirically tested the moderation effect of technological capabilities of an overseas R&D subsidiary. And I reflected a recent trend in the role evolution of an overseas R&D subsidiary from simple role to localize or innovate only for the local market to global innovator.

Based on social identity theory, I expected that mission as global innovator, autonomy and global embeddedness of an overseas

R&D subsidiary have positive impact on its global knowledge sourcing. Because decision makers' confidence and diagnosticity is growing with their capabilities and they can take more risks in this situation, I hypothesized that technological capabilities of an overseas R&D subsidiary will strengthen the relationship between global identity and global knowledge sourcing. Statistical analysis with data of overseas R&D laboratories of Japanese multinational corporations shows that hypotheses related to autonomy(H2), global embeddedness(H3) and moderation effect of technological capability on the relationship between autonomy and global knowledge sourcing(H4b) were supported by the results of negative binomial regression model.

However, this study is not without limitation. First, I empirically analyze the data at the patent level because of limited sample size of the survey and mix of level on research setting. I call for future researches with statistical analysis modeling which can deal multi and mixed level data. The second limitation of this paper is single country of origin problem. Since detailed characteristics of an overseas R&D subsidiary were needed, data from the intensive survey response were essential to test my research model empirically. Thus, future studies should test suggested hypotheses with the data from other countries.

Chapter 4. Conclusion

In this dissertation, I attempted to explore the relationships between organizational antecedents related to organizational identity and knowledge sourcing of an overseas R&D subsidiary of the multinational corporation. Based on integration of organizational behavioral researches on social identity theory and strategic management and international management researches on knowledge sourcing of multinational corporations, I built two separate but related research models and conducted empirical analyses about these models with data from overseas R&D laboratories of Japanese multinational corporations.

The first study of this dissertation is entitled “ Dual organizational identification and knowledge sourcing of overseas R&D subsidiaries: Studies of overseas R&D subsidiaries of Japanese multinationals.” And the second study of this dissertation is entitled “ Global identity and global knowledge sourcing of overseas R&D subsidiaries: Studies of overseas R&D subsidiaries of Japanese multinationals.”

The empirical evidences in these two studies suggested that the concept of organizational identity has substantial potential contributions to explain why and how specific characteristics of an overseas R&D subsidiary facilitate its knowledge sourcing from local or global. In addition, the findings of this paper provide some

practical guidance to decision makers of multinational corporations about how to manage their overseas R&D subsidiaries for knowledge sourcing and innovation.

I propose that future researches based on a more comprehensive framework about the determinants of knowledge sourcing and innovation of overseas R&D subsidiaries should be developed by the inclusion of organizational identity concepts.

Bibliography

Albert, S., & Whetten, D. A. (1985). Organizational identity. *Research in organizational behavior*.

Albert, S., Ashforth, B. E., & Dutton, J. E. (2000). Organizational identity and identification: Charting new waters and building new bridges. *Academy of Management Review*, 25(1), 13–17.

Almeida, P. (1996). Knowledge sourcing by foreign multinationals: patent citation analysis in the US semiconductor industry. *Strategic management journal*, 17(S2), 155–165.

Ambos, T. C., Ambos, B., & Schlegelmilch, B. B. (2006). Learning from foreign subsidiaries: An empirical investigation of headquarters' benefits from reverse knowledge transfers. *International Business Review*, 15(3), 294–312.

Arnett, J. J. (2002). The psychology of globalization. *American psychologist*, 57(10), 774.

Asakawa, K. (2001). Evolving headquarters –subsidiary dynamics in international R&D: the case of Japanese multinationals. *R&D Management*, 31 (1): 1–14.

Asakawa, K., Park, Y., Song, J., & Kim, S. (2015). Zooming In on the Geographical Scope of Knowledge: Embeddedness and Global Knowledge Sourcing by Overseas R&D Subsidiaries, unpublished working paper.

Ashforth, B. E., & Mael, F. (1989). Social identity theory and the organization. *Academy of management review*, 14(1), 20–39.

Ashforth, B. E., Harrison, S. H., & Corley, K. G. (2008). Identification in organizations: An examination of four fundamental questions. *Journal of management*, 34(3), 325–374.

Bartlett C, & Ghoshal S. (1989). *Managing across Borders: The Transnational Solution*. Harvard Business School Press: Boston, MA.

Behrman, J. N., & Fischer, W. A. (1980). Overseas R&D activities of transnational companies. *The International Executive*, 22(3), 15–17.

Birkinshaw, J. (1996). How multinational subsidiary mandates are gained and lost. *Journal of International Business Studies*, 467–495.

Birkinshaw, J., Hood, N., & Jonsson, S. (1998). Building firm-specific advantages in multinational corporations: The role of subsidiary initiative. *Strategic Management Journal*, 19(3), 221–242.

Brown, J. S., & Duguid, P. (2001). Knowledge and organization: A social–practice perspective. *Organization science*, 12(2), 198–213.

Cantwell, J.A., & Mudambi, R., (2005). MNE competence-creating subsidiary mandates. *Strategic Management Journal*, 26(12), 1109–1128.

Chatterjee, A., & Hambrick, D. C. (2011). Executive Personality, Capability Cues, and Risk Taking How Narcissistic CEOs React to Their Successes and Stumbles. *Administrative Science Quarterly*, 56(2), 202–237.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 128–152.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology*, S95–S120.

Doz, Y., Santos, J., & Williamson, P. (2001). *From Global to Metanational*. Boston: Harvard Business School Press, Cambridge, MA.

Doz, Y. L., & Wilson, K. (2012). *Managing global innovation:*

Frameworks for integrating capabilities around the world. Harvard Business Press.

Dutton, J. E., Dukerich, J. M., & Harquail, C. V. (1994). Organizational images and member identification. *Administrative science quarterly*, 239–263.

Ellemers, N., & Haslam, S. A. (2012). *Handbook of theories of social psychology*.

Erez, M., & Gati, E. (2004). A dynamic, multi-level model of culture: from the micro level of the individual to the macro level of a global culture. *Applied Psychology*, 53(4), 583–598.

Erez, M., Lisak, A., Harush, R., Glikson, E., Nouri, R., & Shokef, E. (2013). Going global: Developing management students' cultural intelligence and global identity in culturally diverse virtual teams. *Academy of Management Learning & Education*, 12(3), 330–355.

Foreman, P., & Whetten, D. A. (2002). Members' identification with multiple-identity organizations. *Organization Science*, 13(6), 618–635.

Friedkin, N. E., & Simpson, M. J. (1985). Effects of competition on members' identification with their subunits. *Administrative Science Quarterly*, 377–394.

Frost, T. S., Birkinshaw, J. M., & Ensign, P. C. (2002). Centers of excellence in multinational corporations. *Strategic Management Journal*, 23(11), 997–1018.

Frost, T. S., & Zhou, C. (2005). R&D co-practice and 'reverse' knowledge integration in multinational firms. *Journal of International Business Studies*, 36(6), 676–687.

Gargiulo, M., & Benassi, M. (2000). Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organization Science*, 11(2): 183–196.

Gassmann, O., & von Zedtwitz, M. (1999). New concepts and trends in international R&D organization. *Research Policy*, 28: 231–250.

Gerybadze, A., & Reger, G. (1999). Globalization of R&D: Recent changes in the management of innovation in transnational corporations. *Research Policy*, 28(2–3): 251–274.

Gioia, D. A., & Thomas, J. B. (1996). Identity, image, and issue interpretation: Sensemaking during strategic change in academia. *Administrative science quarterly*, 370–403.

Gioia, D. A., Patvardhan, S. D., Hamilton, A. L., & Corley, K. G. (2013). Organizational identity formation and change. *The Academy of Management Annals*, 7(1), 123–193.

Grabher, G. (1993). The weakness of strong ties: the lock-in of regional development in the Ruhr area. In: Grabher, G. (Ed.), 255–277, *The Embedded Firm*. Routledge, London.

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal*, 17(S2), 109–122.

Hall, B. H., Jaffe, A., & Trajtenberg, M. (2005). Market value and patent citations. *RAND Journal of economics*, 16–38.

Hansen, M. T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative science quarterly*, 44(1), 82–111.

Haslam, S. A. (2001). Your Wish Is Our Command: The Role of Shared Social Identity. *Social identity processes in organizational contexts*, 213.

Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19(3), 441–456.

Hogg, M. A., & Terry, D. I. (2000). Social identity and self-

categorization processes in organizational contexts. *Academy of management review*, 25(1), 121–140.

Hogg, M. A., & Mullin, B. A. (1999). Joining groups to reduce uncertainty: Subjective uncertainty reduction and group identification.

Inglehart, R., & Oyserman, D. (2004). Individualism, autonomy, self-expression. The human development syndrome. *International Studies in Sociology and Social Anthropology*, 74–96.

Ishii, K. (2012). Dual organizational identification among Japanese expatriates: The role of communication in cultivating subsidiary identification and outcomes. *The International Journal of Human Resource Management*, 23(6), 1113–1128.

Jaffe, A.B., Trajtenberg, M., & Henderson, R., (1993). Geographic localization of knowledge spillovers as evidenced by patent citations. *Quarterly Journal of Economics*, 108, 577–599.

Jaffe, A. B., & Trajtenberg, M. (2002). *Patents, citations, and innovations: A window on the knowledge economy*. MIT press.

Janis, L., (1972). *Victims of Group Think*. Houghton–Mifflin, Boston, MA.

Kim, C., & Song, J. (2007). Creating new technology through alliances: An empirical investigation of joint patents. *Technovation*, 27(8): 461–470.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383–397.

Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity, and learning. *Organization science*, 7(5), 502–518.

Kostova, T., & Roth, K. (2003). Social capital in multinational corporations and a micro–macro model of its formation. *Academy of*

Management Review, 28(2), 297–317.

Kuemmerle, W. (1997). Building effective R&D capabilities abroad. *Harvard Business Review*, 75(2): 61–70.

Kuemmerle, W. (1999). Foreign direct investment in industrial research in the pharmaceutical and electronics industries—results from a survey of multinational firms. *Research policy*, 28(2), 179–193.

Makino, S., Lau, C. M., & Yeh, R. S. (2002). Asset–exploitation versus asset–seeking: Implications for location choice of foreign direct investment from newly industrialized economies. *Journal of international business studies*, 403–421.

March, J. G., & Simon, H. A. (1958). *Organizations*. John Wiley & Sons, New York.

Menon, G., Raghurir, P., & Schwarz, N. (1995). Behavioral frequency judgments: An accessibility–diagnosticity framework. *Journal of Consumer Research*, 212–228.

Meyer, A., & Mizushima, A. (1989). Global r&d management. *R&D Management*, 19(2), 135–146.

Miao, Y., Choe, S., & Song, J. (2011). Transferring subsidiary knowledge in the global learning context. *Journal of Knowledge Management*, 15(3), 478–496.

Nag, R., Corley, K. G., & Gioia, D. A. (2007). The intersection of organizational identity, knowledge, and practice: Attempting strategic change via knowledge grafting. *Academy of Management Journal*, 50(4), 821–847.

Nelson, R.R., Winter, S., (1982). *An Evolutionary Theory of Economics Change*. Belknap Press of Harvard University Press, Cambridge, MA.

Nobel, R., & Birkinshaw, J. (1998). Innovation in multinational

corporations: Control and communication patterns in international R&D operations. *Strategic Management Journal*, 19(5): 479–496.

Nunally, (1978). *Psychometric Theory*, 2d ed., New York: McGraw–Hill.

OECD, (2015). *OECD patent database*. Paris: OECD.

Phene, A., & Almeida, P. (2008). Innovation in multinational subsidiaries: The role of knowledge assimilation and subsidiary capabilities. *Journal of International Business Studies*, 39(5), 901–919.

Pugh, D.S., & Hickson, D.J. (1976). *Organizational Structure in Its Context*. Saxon House, Farnborough.

Reed, A., & Forehand, M. (2009), “Linking Brands to Consumer Social Identity: A Theoretical Analysis and Roadmap for Strategies, Tactics and Insights,” working paper, Wharton School of Business, University of Pennsylvania.

Reed, A., Forehand, M. R., Puntoni, S., & Warlop, L. (2012). Identity–based consumer behavior. *International Journal of Research in Marketing*, 29(4), 310–321.

Ronstadt, R. (1977). *Research and development abroad by US multinationals*. Praeger, New York.

Rosenzweig, P. M., & Singh, J. V. 1991. Organizational environments and the multinational enterprise. *Academy of Management review*, 16(2): 340–361.

Roth, K., & Kostova, T. (2003). The use of the multinational corporation as a research context. *Journal of management*, 29(6), 883–902.

Shan, W., & Song, J. (1997). Foreign direct investment and the sourcing of technological advantage: evidence from the biotechnology industry. *Journal of International Business Studies*,

267–284.

Singh, J. (2004). Innovation and knowledge diffusion in the global economy, Doctoral dissertation, Harvard University Cambridge, Massachusetts.

Singh, J. (2005). Collaborative networks as determinants of knowledge diffusion patterns. *Management science*, 51(5), 756–770.

Singh, J. (2008). Distributed R&D, cross–regional knowledge integration and quality of innovative output. *Research Policy*, 37(1), 77–96.

Song, J., Almeida, P., & Wu, G. (2003). Learning–by–Hiring: When is mobility more likely to facilitate interfirm knowledge transfer?. *Management Science*, 49(4), 351–365.

Song, J., & Shin, J. (2008). The paradox of technological capabilities: a study of knowledge sourcing from host countries of overseas R&D operations. *Journal of International Business Studies*, 39(2), 291–303.

Song, J., Asakawa, K., & Chu, Y. (2011). What determines knowledge sourcing from host locations of overseas R&D operations?: A study of global R&D activities of Japanese multinationals. *Research Policy*, 40(3), 380–390.

Song, J. (2014). Subsidiary absorptive capacity and knowledge transfer within multinational corporations. *Journal of International Business Studies*, 45(1), 73–84.

Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information/sur les sciences sociales*.

Tajfel, H. E. (1978). Differentiation between social groups: Studies in the social psychology of intergroup relations. Academic Press.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. *The social psychology of intergroup relations*, 33(47), 74.

Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. CUP Archive.

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behavior. *Advances in group processes: Theory and research*, 2, 77–122.

Turner, J. C., & Oakes, P. J. (1997). The socially structured mind.

Un, C. A., Cuervo-Cazurra, A., & Asakawa, K. (2010). R&D collaborations and product innovation. *Journal of Product Innovation Management*, 27(5), 673–689.

Venaik, S., Midgley, D. F., & Devinney, T. M. (2005). Dual paths to performance: The impact of global pressures on MNC subsidiary conduct and performance. *Journal of International Business Studies*, 36(6), 655–675.

Vora, D., & Kostova, T. (2007). A model of dual organizational identification in the context of the multinational enterprise. *Journal of Organizational Behavior*, 28(3), 327–350.

Westjohn, S. A., Arnold, M. J., Magnusson, P., Zdravkovic, S., & Zhou, J. X. (2009). Technology readiness and usage: a global-identity perspective. *Journal of the Academy of Marketing Science*, 37(3), 250–265.

Zander, I. (1994). *The tortoise evolution of the multinational corporation – foreign technological activity in Swedish multinational firms 1890–1990*. Published Doctoral Dissertation, Institute of International Business, Stockholm.

Zhang, Y., & Khare, A. (2009). The impact of accessible identities on the evaluation of global versus local products. *Journal of*

Consumer Research, 36(3), 524–537.

東洋經濟新報社; Toyo Keizai Shinposha, 海外進出企業總覽:會社別編;
Overseas Japanese companies : sorted by company, 東京 : 東洋經濟
新報社.

METI, (2005). Kaigai jugyo-katsudo kihon chosa [Basic Survey
on Overseas Business Activities]. Ministry of Economy, Trade, and
Industry, Tokyo.

METI, (2013). Kaigai jugyo-katsudo kihon chosa [Basic Survey
on Overseas Business Activities]. Ministry of Economy, Trade, and
Industry, Tokyo.

국문초록

해외 R&D 자회사의 조직 정체성과 지식 습득

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본 박사학위논문은 다국적 기업 해외 R&D 자회사의 조직 정체성이 자회사의 지식 관련 행위와 결과에 미치는 영향에 대하여 실증적으로 탐색하는 것을 목표로 하였다. 사회 정체성 이론과 역량/지식 기반 관점에 근거하여 본 논문에서는 다국적 기업 해외 R&D 자회사의 복합적인 맥락과 이것이 자회사의 지식 습득에 미치는 영향에 관하여 집중적으로 연구하였다. 현지에 위치한 다국적 기업의 현지 조직으로서 해외 자회사는 모기업인 다국적 기업과 현지의 로컬 커뮤니티라는 두 맥락에 동시에 존재하게 되며, 이러한 이중적 맥락에서 조직의 정체성을 파악하고 특정한 목표로 자신의 정체성을 일치시킬 여지가 있다. 또한 해외 자회사는 글로벌 커뮤니티의 일원으로서 자신의 정체성을 일치시킬 수도 있다. 이러한 복합적인 맥락에서의 심리적 애착은 자아 존중감을 향상시키거나 불확실성을 저하시키기 위한 목적에서 특정한 방향으로 주체의 태도나 행위를 바꿀 수 있으며 이는 해외 R&D 자회사의 지식 추구 관련 행위와 결과에도 영향을 미칠 수 있다. 조직 정체성에 관련한 기존 연구들과 다국적 기업의 지식 관련 행위에 관련한 연구들을 결합함으로써, 본 연구에서는 ‘다국적 기업의 해외 R&D 자회사의 정체성이 해외 R&D 자회사의 지식 습득과 혁신에 관련한 태도나 행위에 어떤 영향을 미칠 수 있는가?’에 관하여 탐구하였다.

본 논문의 첫번째 실증 연구(Study I)에서는 다국적 기업 해외 R&D 자회사의 다국적 기업 내부와 현지의 로컬 커뮤니티라는 이중적인

정체성의 맥락하에서 상대적인 조직 동일시 정도가 해외 R&D 자회사의 현지에서의 지식 습득 비중에 미치는 영향에 관하여 조사하였다. 이 실증 연구에서는 조직의 정체성과 관련된 선행 요소로서 조직의 특수성(organizational distinctiveness), 조직의 지위(organizational prestige), 조직 간 협력(inter-organizational cooperation), 조직에 참여하게 된 시기와 조직에 소속된 기간(tenure and recent participation of membership)등의 요인이 이중 정체성의 맥락 하에서 조직 정체성 동일시의 결과로서 지식 습득의 방향에 영향을 미칠 것이라고 보고 이들에 관한 가설들을 수립하였다. 사회 정체성 이론(social identity theory)과 자기 범주화 관점(self-categorization theory)에 근거하여, 본 연구에서는 다국적 기업 해외 R&D 자회사가 보다 많은 자율성을 확보하고 있을 때, 현지 혁신 담당으로서의 명확한 미션을 가질 때, 그리고 모기업 대비 보다 높은 지위를 가질 때, 해외 R&D 자회사가 상대적으로 현지에서 습득하는 지식의 비중이 높아질 것으로 예측하였다. 또한, 모기업인 다국적 기업 내부와의 관계에 배태된 정도가 낮거나 현지 커뮤니티에 보다 깊이 배태되어 있을 때 해외 R&D 자회사가 현지에서 습득하는 지식의 비중이 높아질 것으로 예측하였다. 이에 더하여 현지에 진출하여 활동한 기간이 길 때와 그리고 현지 기업이었으나 다국적 기업에 의해서 인수당했을 때에 해외 R&D 자회사가 현지에서 습득하는 지식의 비중이 상대적으로 높아질 것으로 예측하였다. 본 논문에서는 일본 다국적 기업의 해외 R&D 연구소 자료를 표본으로 사용하여 이와 같은 가설들을 실증적으로 검증하였다. 일본 다국적 기업의 해외 R&D 연구소에 대한 설문 자료와 미국 특허청의 특허 자료들을 통합하여 일반 선형 모형(generalized linear modeling)을 통해 통계적으로 분석한 결과, 제시한 일곱 개의 가설 중에서 네 개의 가설이 실증 모형에 의해 지지되었다. 이러한 결과는 다국적 기업 해외 R&D 자회사가 다국적 기업 내부와 현지의 로컬 커뮤니티라는 이중적인 정체성의 맥락하에서 상대적으로 어떤 쪽에 조직 동일시를 더 많이 하는가가 해외 R&D 자회사의 현지 지식 습득 비중에 영향을 미친다는 것을 실증적으로 입증한 것이다.

본 학위논문의 두번째 실증 연구(Study II)에서는 다국적 기업 해외 R&D 자회사의 지식 습득에 있어서 해외 R&D 자회사의 글로벌 정체성(global identity)이 미칠 수 있는 영향에 대하여 탐색하였다. 사회 정체성 이론과 사회 심리학, 그리고 지식 기반 관점에 근거하여, 본 연구에서는 다국적 기업 해외 R&D 자회사가 본국도 현지도 아닌 그 외의 국가에서 지식을 습득하는 글로벌 지식 습득 행위를 하는데 있어서 해외 R&D 자회사의 조직 정체성이 미칠 수 있는 영향에 대해 탐구하였다. 본국과 현지, 그 외의 국가뿐만 아니라 자회사 내부와 외부를 아우르는 복합적인 정체성과 지식의 맥락 하에서 다국적 기업 해외 R&D 자회사는 다국적 기업 본국에 정체성을 일치시킬 수도 있고, 진출한 국가의 현지 커뮤니티에 일치시킬 수도 있으며, 글로벌 커뮤니티에 속한 조직으로서 자회사의 정체성을 일치시킬 수도 있다. 자아 존중감을 향상시키고 불확실성을 감소시키기 위한 목적에서 다국적 기업 해외 R&D 자회사는 자신이 조직 정체성을 일치시키는 방향으로 자신의 태도와 행위를 적합시키고자 하게 된다. 사회 정체성 이론에 기초하여, 본 연구에서는 해외 R&D 자회사가 글로벌 혁신가로서 명확한 미션을 가질 때, 보다 높은 자율성을 획득하고 있을 때, 그리고 글로벌 커뮤니티에 보다 깊이 배태되어 있을 때에 다국적 기업 해외 R&D 자회사가 글로벌 지식 습득 행위, 본국도 현지도 아닌 다른 국가들에서 지식을 습득하는 행위를 보다 활발하게 할 수 있을 것이라고 예측하고 이에 관한 가설들을 수립하였다. 그리고 다국적 기업 해외 R&D 자회사의 기술적인 역량이 위에서 언급된 글로벌 정체성 관련 요인들과 글로벌 지식 습득 간의 관계를 강화시킬 수 있는 여지가 있다고 보고 조절 효과에 관한 가설 또한 수립하였다. 제기된 가설들에 대한 실증적인 증거를 확보하기 위하여 본 연구에서는 일본 다국적 기업의 해외 R&D 연구소들의 자료를 사용하였다. 설문 자료와 미국 특허청의 특허 자료를 결합하여 표본을 구성하고 음이항 회귀 모형으로 분석한 결과 해외 R&D 자회사의 자율성과 글로벌 커뮤니티에의 배태 정도가 해외 R&D 자회사들의 글로벌 지식 습득에 통계적으로 유의한 긍정적인 영향을 미치는 것으로 나타났다. 또한

해외 R&D 자회사의 자율성과 글로벌 지식 습득 간의 관계를 해외 R&D 자회사의 기술적 역량이 강화하는 것으로 나타나 조절 효과에 관한 가설도 실증적 차원에서 일부 지지되는 것으로 나타났다. 이는 다국적 기업 해외 R&D 자회사의 글로벌 정체성이 해외 R&D 자회사의 글로벌 지식 습득에 긍정적인 영향을 미치며 해외 R&D 자회사의 기술적 역량이 이를 강화한다는 본 연구의 주장이 실증 자료를 통해 검증되었음을 의미한다.

1990년대 이후부터 다국적 기업들은 해외 R&D에 관한 투자 및 활동의 수준을 점차 높여 나가고 있으며, 다국적 기업 해외 R&D 자회사들의 역할 또한 진화하고 있다. 본 박사학위논문은 조직 행위 이론의 조직 정체성 이론과 지식 기반 관점에서의 전략과 국제경영 연구들을 결합하여 연구함으로써, 이론적인 차원에서의 기여를 함과 동시에 이러한 중요한 실제 현상에 관한 이해 또한 향상시킴으로써 실제 다국적 기업 경영에 대한 시사점을 제공하는 것을 목적으로 진행되었다. 실증 연구 결과는 다국적 기업 해외 R&D 활동을 통한 지식 습득에 있어서 조직 정체성이 실질적인 영향을 미칠 수 있음을 보여주었다.

주요어 : 조직 정체성, 조직 정체성 일치/ 동일시, 지식 습득, 이중 조직 정체성, 해외 R&D 자회사, 자율성

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