

**EXTERNAL-INTERNAL LINKAGES AND
OVERSEAS AUTONOMY-CONTROL TENSION:
THE MANAGEMENT DILEMMA
OF THE JAPANESE
R&D IN EUROPE**

by

K. ASAKAWA*

95/90/OB

- * Phd Candidate, at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France; Lecturer in International Management, at Keio University, 2-1-1, Hiyoshi-honcho, Kohoku-ku, Yokohama 223, Japan.

A working paper in the INSEAD Working Paper Series is intended as a means whereby a faculty researcher's thoughts and findings may be communicated to interested readers. The paper should be considered preliminary in nature and may require revision.

Printed at INSEAD, Fontainebleau, France

**External-Internal Linkages and Overseas Autonomy-Control Tension:
The Management Dilemma of the Japanese R&D in Europe**

Kazuhiro Asakawa

**Graduate School of Business Administration,
Keio University
2-1-1, Hiyoshi-honcho,
Kohoku-ku, Yokohama 223,
Japan**

and

**INSEAD,
Bd. de Constance,
77305, Fontainebleau Cedex,
France**

November 1995

**External-Internal Linkages and Overseas Autonomy-Control Tension:
The Management Dilemma of the Japanese R&D in Europe**

Abstract

By examining how external/internal linkages held by overseas R&D labs affect autonomy-control tension within MNCs, managerial dilemmas pertinent to international R&D management will be discussed, especially in the context of internationalization of Japanese R&D in Europe. R&D is liable to be affected by high autonomy-control tension due to countervailing institutional forces at the functional level (research/corporate) and the geographical level (host country/ home country). The external linkages an overseas R&D lab develops tend to increase the expected degree of local autonomy vis-à-vis the parent. The external linkages tend to increase the need for internal control on the part of the parent, especially when such sensitive issues as intellectual property rights and research initiatives are involved. Managers use internal linkages as a condition based on which local autonomy can be granted. Similarly, high degree of internal linkages tend to decrease the difficulty of internal control and would even allow for some potential increase in local autonomy. An alternative multinational linkage strategy becomes necessary for the Japanese MNCs in the era of global R&D management in which the conventional social/cultural control mechanism may break down. This paper attempts to provide a conceptual framework which enables us to associate such differences in linkage patterns with autonomy-control tension in a systematic way so that some new insight would be obtained regarding this classic yet unresolved tension.

Key Words

External/internal linkages; autonomy-control tension; international R&D management; headquarters-subsidiary relation; multinational linkage mechanism; Japanese MNC; social/cultural control; organizational boundary; knowledge link.

1. INTRODUCTION

Managing overseas R&D is a challenging task. How to maximize the benefit of overseas R&D activities while maintaining internal consistency as a company? Creative research may require local autonomy, but a certain degree of control is also required to maintain organizational unity.

While the importance of local autonomy is well recognized for the purpose of local responsiveness (as for D) and research breakthrough (as for R), excessive autonomy may break internal consistency as a company. On the other hand, excessive control from the parent may stifle local creativity. The optimal balance between autonomy and control becomes necessary. While such a classic tension has been well studied at different levels [14], [7] and [21], it is quite salient in R&D, because R&D is torn between the pressures for scientific and commercial results. Unlike other functions, R&D embraces its dual nature: on the one hand, R&D (especially basic research -R) is strongly driven by what we call *scientific logic*, i.e. the logic of quest for truth, the pressure from *business logic*, i.e. the logic of profit maximization, is not trivial. The companies ultimately expect the potentially useful research findings even from the very basic research labs, for otherwise there would be no difference from the pure research at the universities. While appropriating state-of-the-art local knowledge is encouraged, excessive pure research with no potential commercial application whatsoever even in the long term is supposed to be discouraged. Basic research requires long-term intangible investment, but it has to respond to short-term bottom-line oriented pressure from the business side. However, the real difficulty lies in the fact that no one is sure whether the particular research would be totally useless or not when the research is conducted.

While R&D is a part of the firm, scientists maintain informal research network with external scientific community, which generates their own shared value across formal boundary of the firm. This makes organizational boundary blur in the knowledge dimension. While successful appropriation of local knowledge requires local scientists' formal and informal interaction with local research community [26], excessive "knowledge-link" [1] might potentially endanger protection of core knowledge and corporate governance. Excessive commitment to acquisition of local tacit knowledge might sacrifice internal tacit knowledge caused by lack of internal communication. While companies

sense a need for control and coordination to some extent for the sake of internal consistency, traditional control mechanisms don't seem to apply well to scientific-logic-driven organizations. Not only bureaucratic control but also social (cultural, normative) control doesn't seem to work as much, since under the norms of scientific-logic, scientists feel more strongly attached to their profession than to their employers.

On top of that, such tension becomes even more salient in the international context, since the expected degree of autonomy held by scientists and project managers varies across culture. The autonomy-control tension becomes quite salient when host and home-country environments set different role expectations for the overseas R&D labs.

In sum, R&D is liable to be affected by high autonomy-control tension as a result of tension between different institutional environments at the functional level (research/corporate) and at the geographical level (host country/home country).

This tension may manifest itself in the most salient form when both parent and local labs deal with the following fundamental managerial dilemmas associated with overseas R&D management:

1) How to facilitate "local-for-local" innovation without suffering from "needless differentiation"? Or How to facilitate "locally-leveraged" innovation without a substantial "internal coordination cost"? [2].

2) How to appropriate *external* tacit knowledge by localizing in overseas environment while maintaining *internal* tacit knowledge? While tacit knowledge is difficult to be appropriated from distance [26], [27], localization of R&D abroad would generate internal communication problem which makes it more difficult to update internal tacit knowledge which could have been attained more easily through face-to-face interaction.

3) How to adapt to local research and management practice while maintaining internal consistency as a corporation? For instance, while DiMaggio and Powell [7] predicted that "the greater the reliance on academic credentials in choosing managerial and staff personnel, the greater the extent to which an organization will become like other organizations in the field," a remarkable difference in HRM systems (such as training and careers) of researchers in Japan and the West for instance [28] would make internal consistency quite difficult to achieve.

4) How to take advantage of external research collaboration while protecting intellectual

property right? While receiving know-how involves obligation to give back and how much is exchanged depends on what the other parties know and can give [25], [26], excessive knowledge-link beyond the organizational boundary [1] would cause knowledge erosion. Especially in the case of company-university collaboration, to what extent should the academic findings belong to the company or to a public good?

5) How to continue to pursue long-term scientific research at overseas labs while facing the short-term bottom-line oriented pressure from the corporate? In basic research, in which current research does not guarantee to produce potentially-commercializable knowledge, neither behavioral nor output control by the corporate is relevant. Nevertheless, granting excessive autonomy to the local lab that is unproportional to other subunits may generate jealousy and lack of morale within the firm.

In this paper, we will attempt to highlight one of the most fundamental tensions in organization, i.e. autonomy-control tension, specifically in the context of overseas R&D management, by going beyond the identification of host/home-country isomorphism to examine the causal link between external-internal linkages and overseas autonomy-control tension. External-internal linkages serve as a useful framework to capture the specific mechanisms through which the alternative institutional claims operate. By tying institutional isomorphism to network approach, we could show how structural isomorphism operates through the patterns of social ties surrounding the actor.

How do external-internal linkages affect the autonomy-control issue? Current overseas R&D activities of Japanese MNCs provide a relevant case for this issue, since many Japanese firms with overseas R&D activities are beginning to face such a tension. Especially for Japanese MNCs in which high degree of control and autonomy operate simultaneously (i.e. cohesive social/cultural control through expats would allow local subsidiary to be fairly autonomous in sales, manufacturing, etc.) [15], [29], limited application of social control to the local scientists in overseas basic research labs would generate a major potential challenge to cope with excessive pressure for autonomy.

Cultural distance (or difference in institutional environments) between Japan and the Europe regarding research and management practices will provide a unique context in which the impact of cross-national institutional and structural isomorphism on autonomy-control tension can be studied. Moreover, this rapidly disseminating phenomenon, which did not leave much room for close research

yet, provides a real-time examination of the evolution of autonomy-control tension specific to the start-up phase between parent and localized R&D labs.

This paper attempts to provide a conceptual framework which enables us to associate such differences in linkages patterns with the degree and the type of autonomy-control tension in a more systematic way, so that some new insight would be obtained regarding this old but important issue in the areas of organization studies and international management.

2. PREVIOUS RESEARCH

In general, internationalization of R&D with a few exceptions is a fairly recent phenomenon, and only a small part of R&D labs deliberately set up abroad are more than a couple decades old [11], [19] and [20]. But there are some clear trends towards an increasing activities of R&D across borders [10]. Nevertheless, with some exceptions [5], [22], [16] and [3], the management of multinational R&D has been a neglected topic in international business research [4].

Autonomy-Control Tension in International R&D Management

Contrary to the classic nature of the autonomy-control tension, the literature on this tension, or even on local autonomy, in the context of international R&D management is sparse.

Cheng and Bolon [4] summarized some major works related to this issue. Behrman and Fischer's [3] extensive discussion of centralization-decentralization was based on their identification of four management styles: (1) absolute centralization, (2) participative centralization, (3) supervised freedom, and (4) total freedom. They found out that most of the firms's management styles were in the second and the third categories. Firms with a home-market orientation are more centralized than host-market or world-market firms. Among firms with home-market orientation, those that are in high-tech industries (pharmaceuticals, electronics, etc.) tend to employ the participative centralization management style.

De Meyer and Mizushima [6] found out 1) that a company's basic tendency or orientation toward centralization affect R&D centralization, 2) that greater time pressure affects the tendency

toward centralization, and 3) that smaller the size of the foreign labs, the stronger the corporate control exercised over them.

Ghoshal and Bartlett [9] found out that the amount of local autonomy a foreign subsidiary had varied with the innovation tasks (creation, adaptation, and diffusion) it performed. Subsidiaries that only created innovations had the largest local autonomy. Those that both created and adopted innovations had the least local autonomy. Those that created, adopted, and diffused innovations had intermediate amounts of local autonomy.

Pearce and Singh found out in their surveys that the majority of overseas R&D facilities now play roles that subject their operations to consistent review, if not active coordination, by parent laboratories, while the parent tend to perceive that it grants local autonomy [19], [20].

While in most the studies presented above, the attention was made more to the degree of local autonomy than to the degree of autonomy-control tension, the different perceptions about parent involvement between parent and subsidiary laboratories identified by Pearce and Singh [19], [20] may imply such a tension. Our exploratory fieldwork also hinted that the tension between autonomy and control may vary as well. There is no literature on the degree of overseas autonomy-control tension.

R&D Internationalization by Japanese MNCs

Internationalization of R&D is a recent phenomenon for most of the Japanese MNCs. If the 60s and 70s have been the decades which can be characterized as internationalization of sales through export, and if the 80s has been the decade of internationalization of production facilities as represented by NUMMI plant [17], the 90s may be the decade of overseas R&D localization.

The percentage of the R&D expenditure carried out by their overseas R&D units still remains to be small [19], [20]. According to their survey, "though there are clear indication of a fast-growing interest in overseas R&D amongst globally competing Japanese enterprises this has not yet reached strong quantitative levels, with no respondents reporting over 5% of group budgets overseas and 71% no such expenditure." While the portion of overseas R&D activities remains to be small yet, many companies indicated that a large portion of their R&D activities will be outside Japan in the near future. For example, NEC and Sumitomo Electrics intended to have ten per cent of their R&D

activities abroad by 1995, and Hitachi has forecast that one third of all its researches may be outside of Japan by the end of the century [23]. Pearce and Singh's survey identified that 81% of their Japanese companies respondents showed a notable enthusiasm for the a globally-integrated R&D network approach [19], [20].

In their recent paper, Papanastassiou and Pearce [18] summarized particular roles played by overseas R&D units of Japanese enterprises: The first role is to provide basic research inputs, that help the Japanese parent companies to derive the basis for a new generation of products, and this role appears to be especially prominent in Japanese MNCs who are notably responsive to the high-quality science-base in certain countries. The second role is to develop specific variants of new products that fully respond to distinctive consumer needs, and production conditions, in important national or regional markets.

The formal research collaboration with external research partners (universities, research institutions, other firms etc.) is less common among Japanese MNCs than among the Western firms [19], [20]. Nevertheless, the external collaboration exists between the Japanese firms and outside partners in many forms, such as relationships with elite research universities, joint ventures, licensing, contracted R&D projects, etc. [12].

Internationalization of R&D in Europe is a recent phenomenon for most of the Japanese MNCs. It is only in the past several years since the Japanese MNCs started their rapid increase in overseas R&D. As of January 1990, there were only 72 R&D bases of Japanese manufacturers in Europe. By the end of January 1993, the number increased to 232 [13].

Summary

The review of the previous research shows what we know and what we don't know in the literature pertinent to this issue: 1) that internationalization of R&D is a fairly recent phenomenon in general, and particularly for the Japanese MNCs, 2) that very few studies on organizational/managerial aspect of international R&D exist, 3) that factors affecting the degree of autonomy/control (but not the tension between the two) have been investigated, but the study on the autonomy-control tension in the context of international R&D management is sparse, 4) that the overseas R&D facilities and the

parent have perception gap as to the degree of autonomy granted to the local lab, 5) the perception of the extent of parent involvement in overseas R&D facilities varies between parent and subsidiary laboratories, and 6) the Japanese MNCs are both enthusiastic and hesitant about international decentralization of R&D. In short, while subtle tension between autonomy and control seems evident in overseas R&D labs, this particular dynamics hasn't captured sufficient attention.

3. THEORETICAL FRAMEWORK

While autonomy and control consists of a classic tension in any organizational setting, this tension becomes particularly salient in international R&D, as discussed above. Autonomy-control tension is defined here as the discrepancy in degree of autonomy and control perceived by parent and by local labs, in terms of both perceived reality (i.e. how things are) and normative expectation (i.e. how things should be). The autonomy-control tension is the result of a tension between different institutional environments at the functional level (research/corporate) and at the geographical level (host country/home country). Each environment sets different role expectations for the localized R&D lab, which is therefore caught in the middle of different institutional pressures. External/internal linkages are defined as all the formal/informal networks the overseas R&D labs have with external/internal units.

Impact of External-Internal Linkages on Autonomy-Control Tension

Impact of external linkages

(a) On local autonomy:

When a particular overseas R&D lab engages in external linkages with local research partners, how do such external linkages affect its autonomy vis-à-vis the parent? Toward the parent, the strong

external linkages it has with local research partners may enhance its expected degree of autonomy by providing it with a kind of bargaining power, especially 1) if the external partners are valued by the parent and other internal subunits, and 2) if the local lab is directly linked to the external partners and all the other internal subunits have to go through the local lab (i.e. broker role). The structural isomorphism embedded to external linkages would enhance the expected degree of local autonomy toward the parent. Therefore,

Hypothesis 1: The formal/informal external linkages an overseas R&D lab develops would increase the expected degree of local autonomy vis-à-vis the parent.

(b) On internal control:

The strong external linkages of the overseas R&D lab with outside partners may enhance the expected degree of local autonomy, and that may, in turn, necessitate internal control to countervail local autonomy.

On the other hand, it becomes more difficult to control local labs that are strongly linked to external research partners by the conventional control mechanisms (bureaucratic and social): The control becomes difficult when the overseas lab is **formally** linked to the external parties, since decision-making has to be done in consultation with them (as in the case of joint R&D venture); It becomes difficult even if the local lab is not formally linked to the external parties, since the local scientists and even directors are **informally** linked to local scientific community and their primary commitment usually goes there rather than to their companies. The pattern of social ties surrounding the scientists would largely determine the structural isomorphism toward local scientific community. Therefore,

Hypothesis 2-A: The formal/informal external linkages an overseas R&D lab develops would enhance the need for internal control on the part of the parent;

and yet,

Hypothesis 2-B: The formal/informal external linkages an overseas R&D lab develops would enhance the difficulty of internal control.

Impact of internal linkages

(a) On local autonomy:

As the internal linkages with parent and local subunits intensify, would local autonomy increase or decrease accordingly? In general, from the structural autonomy perspective, dense internal networking would decrease structural holes and would increase redundant links, and thus that would decrease local autonomy. But from the cultural control perspective, the internal linkages would prepare a condition in which local autonomy can be granted [8]. Therefore,

Hypothesis 3-A: The high degree of internal linkages would reduce the expected degree of local autonomy held by the overseas R&D labs;

and yet,

Hypothesis 3-B: Managers could use it as a condition based on which local autonomy can be granted.

(b) On internal control:

As the internal linkages with parent and local subunits intensify, the difficulty of internal control would decrease, since the local labs becomes tightly connected internally via people exchanges and flows of information which would serve as tools for cultural control [8]. Therefore,

Hypothesis 4: High degree of internal linkages would decrease the difficulty of internal control and would even allow for some potential increase in autonomy.

Managerial mechanisms

The degree of autonomy-control tension in overseas R&D is affected by institutional distance at geographic (i.e. home/host country) and/or functional (i.e. research/corporate) levels. Such

institutional distance is affected by the degree of external/internal linkages. Management could encourage or discourage external or internal linkages to some extent so as to minimize the institutional distance between host country and home country environments or between research and corporate. Even if external linkages outweigh internal linkages, top management's involvement in the forms of visionary support and risk-taking commitment to local autonomy could replace internal linkages, by providing legitimacy to local autonomy. The relationship among these key constructs can be visualized in the following figure.

insert figure 1 about here

4. METHOD

Ten Japanese MNCs were selected for the exploratory interviews. The interviews with the R&D managers, both in Europe and in Japan, have been conducted between August 1993 and April 1994. The main purpose was to identify what the R&D managers' main concerns are regarding the management of overseas R&D labs. Therefore open-ended interviews were used to gather data. The following is a list of companies: SHARP (HQ and Oxford), Canon (HQ and Surrey, UK), Eisai (HQ and London), Yamanouchi (HQ and Oxford), Kao (HQ and Darmstadt, Germany), Shiseido (HQ), Kobe Steel (Surrey, UK), Sumitomo Electric (HQ), Hitachi (HQ), NEC (HQ), and Asahi Glass (HQ) - Glaverbel (Bruxelles). All the interviewees are either top management at R&D headquarters in charge of international business and R&D or key R&D managers at parent or local labs. Mitsubishi Research Institute's project team on strategic R&D management provided current management problems related to R&D management from their point of view.

Building upon the general understanding of the issue, further interviews have been conducted with structured questions on focused issues with Canon, Sharp, Eisai, Yamanouchi, Kao and Asahi Glass between May 1994 to August 1994. The issues of our particular interest were the following: 1) the impact of external/internal linkages on autonomy-control tension; 2) managerial mechanisms

to cope with such tension; and 3) implication for overseas R&D performance. In this paper, we focus our findings on the first point.

5. FINDINGS

The impact of external linkages

Some Japanese MNCs have their overseas R&D labs that are relatively strongly linked to external research community. By industry, pharmaceutical companies tend to engage in active research linkages with external partners. Eisai's 50-year contract with the University College of London (UCL) to locate its basic research laboratory and to collaborate with the university scientists is a notable case. Dr. Lee Rubin, laboratory director, has a joint appointment as professor at UCL. A number of research projects previously done in UCL have moved to Eisai, yet conducted by the same research staff members. Eisai's Boston Laboratory, which is more in D-side, has a Harvard professor on the supervisory board but has no direct link with the university. Yamanouchi Pharmaceutical similarly established its basic research lab next to Oxford University, and engages in active external linkages, including the recruitment of laboratory director from Glasgow university (who still holds a visiting professorship there) and of scientists from many local universities. Fujisawa is similarly getting to become active. Takeda, while also being active in external linkages, engages in joint R&D venture with local partners.

In electronics industry, some companies like Canon, Sharp and Hitachi are quite actively engaged in external research linkages. For example, Canon Research Europe (CRE) in Surrey-Guildford, UK was established by recruiting a professor at UCL (Dr. Paul Otto). Again his research projects at his UCL lab was moved to Canon. Sharp established its basic research lab (Sharp Research Europe - SRE) on Oxford Science Park and runs it quite autonomously, by recruiting a former government official, Dr. Bradley, as laboratory head. Hitachi is similarly conducting basic research at Cambridge as well as in Dublin.

There are many different ways of external linkages: Perhaps the cases of Eisai and Canon are quite unique in that they "coopted" [24] the local research people, projects and the whole context into

their local labs. Sharp and Yamanouchi both established their basic research labs on Oxford Science Park, yet they are not on Oxford campus. Takeda's preference is external linkages through joint venture. Kao and Asahi Glass both engage in local R&D activities through acquisition.

The question is whether such different approaches to external linkages make any difference in terms of the degree of autonomy-control tension.

Our first hypothesis states that the formal/informal external linkages an overseas R&D lab develops would increase the expected degree of local autonomy vis-à-vis the parent (H1). We also predicted that the formal/informal linkages would enhance the need for internal control on the part of the parent (H2-A) and yet the linkages would enhance the difficulty of internal control (H2-B).

For the companies in our sample, local R&D managers of Sharp, Canon, Eisai, Yamanouchi, all actively engaged in interaction with the external research community, unanimously expressed the importance of a certain degree of local autonomy. But while the local scientists may only wish stronger local autonomy, local R&D head or other liaison persons also recognized the need for coordination with the parent and didn't explicitly stated the need for greater autonomy vis-à-vis the parent. Why? Two explanations can be found from our interviews with the R&D managers.

First, these overseas R&D labs are already given substantial autonomy from the parent given the symbolic nature of internationalizing R&D. For many firms, localization decision was made by top management who encourages independence held by overseas R&D labs for the purpose of fostering locally-specific research practice (e.g. Sharp, Canon, Eisai, Yamanouchi, Hitachi, NEC). Second, unlike their previous experiences in internationalization, the Japanese MNCs are not able to implement social (or cultural) control to the overseas local scientists. Instead they give autonomy to the local scientists while expecting the local top management (both expat and local hire) to play the liaison role. The following are some examples regarding these points.

- For Eisai, localization of R&D was the dream of the CEO and the decisions to open Boston and London labs were made quite swiftly. Boston and London labs were initially reporting directly to corporate top management instead of reporting to the R&D headquarters. In that respect, London and Boston have had autonomy vis-à-vis the parent R&D headquarters. Calling it "upstream strategy", Eisai gives high priority to its overseas R&D labs for the basic discovery research, and not many Japanese scientists are intentionally dispatched so as to encourage locally-specific research practice. Dr. Rubin, Director of London lab maintains

professorship at UCL, and Professor Kishi of Harvard sits as head on the Advisory board of Boston lab. Besides these directors, Mr. Tsuchiya, Administrative Director of ELR, plays extensive coordination role which allows ELR scientists to be sufficiently autonomous. Formerly being a scientist at Tsukuba R&D lab, he was in charge of opening a new R&D liaison office in US, then was seconded to the UK to establish ELR.

- Yamanouchi Pharmaceutical's basic lab was established next to Oxford University, suggested by managers at London office and approved by strong top management support, with some hesitation on the part of middle-management. Dr. Lackie, former Professor at University of Glasgow, was recruited as Director. Because of the clear mission of the Oxford lab to focus on long-term fundamental research, the lab already enjoys substantial local autonomy. On the other hand, a local R&D top manager commented that the local lab needs more information and direction from the parent as well.

- Sharp Laboratory Europe (SLE), the basic research lab on the Oxford Science Park, was established in 1990 with a strong support of top management, and has been establishing links with other research organizations within the UK and in the EC. Dr. Bradley, Managing Director of SLE, said that the lab is quite independent from the rest of the company (i.e the parent as well as other local subsidiaries). A local R&D manager commented that improving communication with the parent to obtain real-time information is of higher priority than increasing local autonomy. Dr. Kataoka, then top R&D director of Sharp, intentionally refrained from giving instruction to SLE during the start-up phase so that it would develop its own locally-specific research practice. At the same time, Dr. Kataoka and his staff at R&D headquarters constantly maintain in touch with the SLE top management staff. Dr. Kataoka himself did his doctorate at UCL and is widely connected to local research community, and therefore he is quite supportive to the local autonomy.

- Canon's overseas R&D labs have been established in UK, US, France and Australia again by the strong top-down decision supported by both former President Yamaji and current President Mitarai. Canon Research Europe (CRE) recruited a former UCL faculty, Dr. Otto, as COO and local research head reporting to the CEO, Mr. Negishi, and has active external research collaboration with some universities, such as University of Manchester and Surrey University. While Canon's overseas R&D labs don't seem to have as much local autonomy as Eisai's, they are gradually gaining more autonomy, as symbolized by the recent succession of Directorship at CRE from Mr. Negishi, a Japanese expat manager, to Dr. Otto as of November 1, 1994.

Therefore, while our interview data generally supported Hypothesis 1, the point didn't come out explicit in the form of demand for greater local autonomy, since many local labs that are most actively engaged in external research collaboration already got substantial autonomy. However, at

the perceptual level, this point was unanimously supported by the local R&D staff.

Hypothesis 2 was partially supported by some of our interviews while other firms commented that they haven't reached the stage to worry about such an issue yet. Two issues were identified: 1) intellectual property right and 2) research initiatives.

Regarding the intellectual property right issue, a dilemma pertinent to "trading secrets" [26], i.e. trade-off between open information exchange and knowledge erosion was pointed out. Particularly in the case of collaboration with university scientists, the timing of presentation of scientific papers and patent sometimes became an issue. Restricting the presentation of papers may secure corporate secrecy, but such an act may immediately lose partnership with university professors. Mr. Negishi, former Director/CEO of Canon Research Europe (UK), emphasized that patent may be a potential source of social problem because of the tradeoff between protection of corporate ideas and stifling of free innovative activities. A number of firms suggested that as business-academic collaboration becomes intensive, more concrete procedural agreement should be made, such as the timing and first refusal right of publication.

Regarding the research initiatives issue, a number of firms pointed out the risk of losing the initiatives on the joint research projects. Given the nature of scientists, they have a tendency to be driven by scientific logic (i.e. logic of quest for truth), and the firm may lose its initiative on joint research with university. Or a similar concern was raised in the context of joint R&D venture. In spite of its majority ownership, Asahi Glass hasn't capitalized on its local partner, Glaverbel's R&D, which has established its own locally-specific research agenda. Similarly, the major challenge of Kao's European R&D strategy is to integrate the recently-acquired Goldwell R&D lab into Kao's research context as smoothly as possible.

The impact of internal linkages

The degree and pattern of internal linkages between an overseas lab and other internal subunits do differ across industries, companies, and types of research. For example, the way an overseas lab in a pharmaceutical company interacts with other subunits is assumed to be different from the way an overseas lab in an electronics company interacts with other subunits. The reason for such an

assumption comes from their different localization patterns: the former is stand-alone localization (i.e. R&D localization without manufacturing), whereas the latter is cluster or sequential localization (i.e. R&D after manufacturing). More concretely, even if both Yamanouchi's and Sharp's basic labs are located in Oxford Science Park, their internal linkage patterns may be different from each other.

The patterns of internal linkages are different among different companies. Various internal linkage mechanisms include frequent formal conference, regular video-conference, expatriation of managers, scientists and trainees, rotation policy, etc.

Even within a same company, such patterns of internal linkages may differ across different research types. For example, both in Sharp and in Canon, overseas D labs are more tightly linked to internal subunits than their R counterparts.

The question is whether such different patterns of internal linkages make any difference in terms of the degree of autonomy-control tension. Hypothesis 3-A predicted that the high degree of internal linkages would reduce the expected degree of local autonomy held by the overseas R&D labs. And yet hypothesis 3-B says that managers could use it as a condition based on which local autonomy can be granted. Hypothesis 4 states that high degree of internal linkages would decrease the difficulty of internal control and would even allow for some potential increase in autonomy.

Hypothesis 3-A was not supported enough by our limited interview data. Although we have managed to get the following information: joint R&D project with other lab(s), (very few, with some exception); frequency of trips for face-to-face meeting with other subunits (regular among management -several times a year- but rare among scientists); of inter-subunit video-conference (very few to every month); and number of expat scientists and exchange of trainees (usually not many, with 2-3 per lab on average), we haven't got frequency data on social network among local labs and the parent, especially at the informal level. Unfortunately, such data are quite important to evaluate this hypothesis. Even if we enlarge our definition of internal linkages to include top management's support and commitment to overseas R&D labs, we failed to find any supporting evidence to show that local R&D labs became tamed by receiving top management's support.

Hypothesis 3-B, on the other hand, was supported by our data. As in the case of Eisai London lab, autonomy was granted because of the strong liaison role played by Mr. Tsuchiya. Or personal trust between Dr. Kataoka (Sharp HQ) and Dr. Bradley (SRE) or between Mr. Negishi (UK) and Mr.

Sueda (Canon HQ) made it possible for autonomy to be granted to overseas labs. Unfortunately, however, our data were mostly limited to internal linkages at management level, which reserves our conclusion.

Hypothesis 4, in consistent with Hypothesis 3-B, was supported by our data. Top management of Sharp, Canon, Eisai and Yamanouchi feels more comfortable to grant autonomy to the overseas R&D top managers who are well integrated into the corporate network.

6. CONCLUSIONS

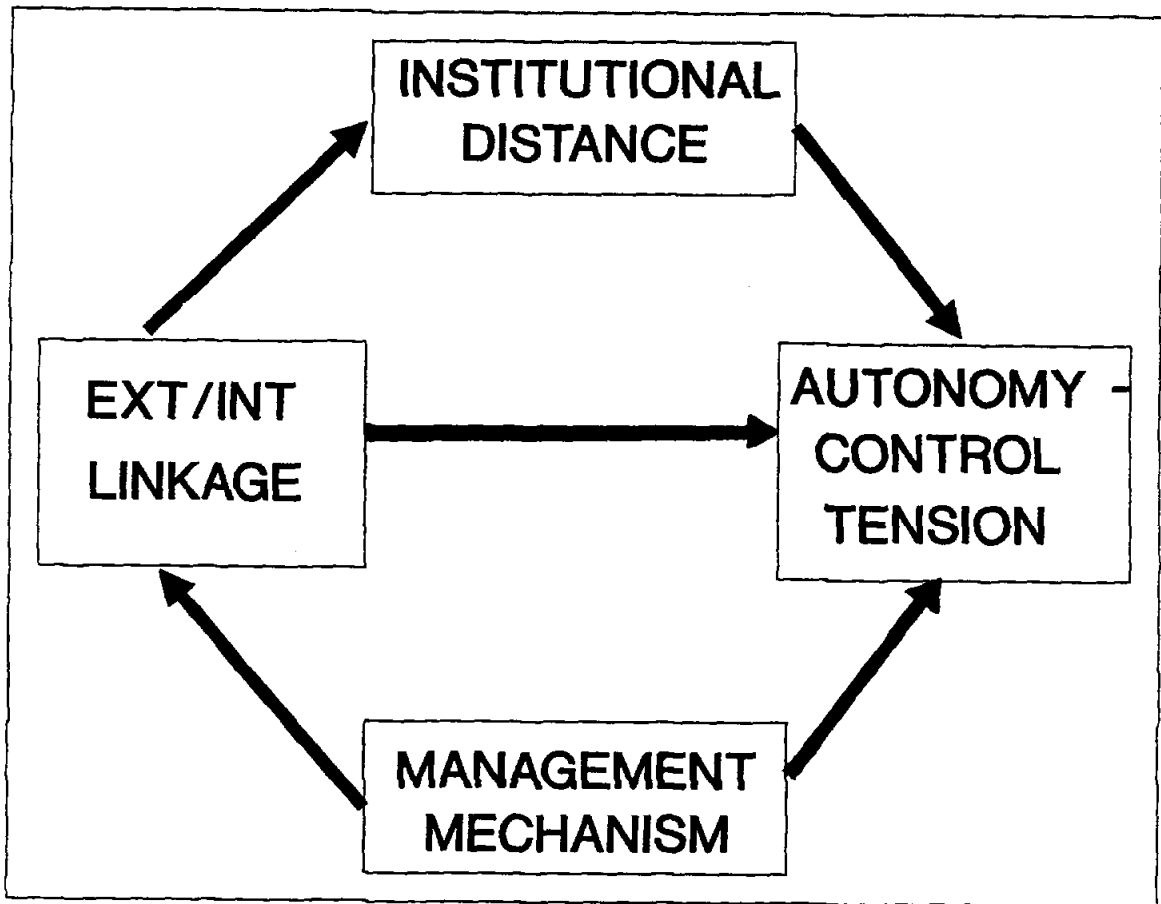
Our field study of Japanese R&D in Europe explored the impact of external/internal linkages held by overseas R&D labs on autonomy-control tension within MNCs. We found that the external linkages an overseas R&D labs develops tend to increase the expected degree of local autonomy vis-à-vis the parent, at least at the perceptual level. The external linkages tend to enhance the need for internal control on the part of the parent, especially when such sensitive issues as intellectual property rights and research initiatives are involved. Although we were unable to prove, with our limited data, that high degree of internal linkages would reduce the expected degree of local autonomy held by the overseas R&D labs, we found that managers use internal linkages as a condition based on which local autonomy can be granted. Similarly, high degree of internal linkages tend to decrease the difficulty of internal control and would even allow for some potential increase in autonomy.

Such findings may imply some important changes in multinational strategy of Japanese firms. First, in the context of international R&D management, the Japanese MNCs have come to a point where they need to adopt a new linkage strategy. Their conventional use of social/cultural control through expatriation, rotation, corporate culture and mission doesn't seem to apply to the overseas R&D labs in which local scientists tend to have higher commitment to their own research and outside research community than to their employers. The accumulated experiences held by Japanese MNCs in overseas sales, marketing, manufacturing and even development cannot always be applicable to such a new situation. In this respect, even the Japanese MNCs, one of the most ethnocentric organizations, are forced to adapt to the coming knowledge-based, fragmented, heterogeneous form of organization.

However, at the same time, the Japanese MNCs seem to preserve their administrative heritage in that they try to maximize their use of internal linkages, especially at the management level if not at the scientists level. A majority of R&D managers emphasized the importance of shared understanding and mutual trust between the parent R&D managers and their counterparts at overseas R&D labs. While they don't even attempt to control overseas scientists in the same way as overseas factory workers, they tend to spend sufficient time for recruitment to carefully examine the potential alignment of research interests of a new hire and of the firm.

Although the data presented in this paper here examines only Japanese R&D in Europe, the theoretical context developed here should be more general in nature, since external/internal linkages may affect autonomy-control tension regardless of the firms' countries of origin. However, that doesn't mean that the findings are generalizable. Clearly further research is needed to specify the degree of impact external/internal linkages make upon autonomy-control tension by using more comprehensive data to be collected by questionnaire survey. This paper is our initial attempt to show the newly-emerging multinational strategy of Japanese MNCs in the era of global R&D management. For that purpose, we shed light on the causal link between external/internal linkages and overseas autonomy-control tension by going beyond the identification of host/home country isomorphism in R&D practices. Now that the fad of Japanese management has almost died out, it is important for the Western business scholars and strategists not to disregard such an emerging strategic change by the Japanese MNCs, which may open door for further international collaboration between Japanese and Western firms.

Fig.1. Relationship among key constructs



Acknowledgement

I would like to thank Profs. Michael Brimm, Yves Doz, Arnoud De Meyer and Martin Gargiulo for their helpful comments on the earlier research ideas of this work. I would also like to thank INSEAD and Sasakawa Foundation for their funding support. Finally, I extend my appreciation for the generous support of the managers and scientists/engineers of the research sites.

Profile

Kazuhiro Asakawa is Lecturer of International Management at the Graduate School of Business Administration, Keio University, Japan. His Ph.D dissertation at INSEAD focuses on multinational tension in international R&D network. He received his MBA from Harvard University and his BA *summa cum laude* from Waseda University, Japan. His research interest includes interface between organization theory and multinational management, international knowledge management, as well as international human resource management.

REFERENCES

- [1] J. L. Badaracco, *The Knowledge Link: How Firms Compete Through Strategic Alliances*. Boston, MA, Harvard Business School Press. 1991.
- [2] C. A. Bartlett and S. Ghoshal, "Managing innovation in the transnational corporation," C.A. Bartlett et. al. (eds.) *Managing the Global Firm*. London and New York, Routledge, 1990.
- [3] J. N. Behrman and W. A. Fischer, *Overseas R&D Activities of Transnational Companies*. Cambridge, MA., Oelgeschlager, Gunn & Hain. 1980.
- [4] J. L. C. Cheng and D.S. Bolon, "The management of multinational R&D: A neglected topic in international business research," *Journal of International Business Studies*, I.: 1-18, 1993.
- [5] A. J. Cordell, "Innovation, the multinational corporation: Some implications for national science policy." *Long Range Planning* 6: 22. 1973.
- [6] A. De Meyer and A. Mizushima, "Global R&D management." *R&D Management* 19(2): 135-146. 1989.
- [7] P. J. DiMaggio and W. W. Powell, "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields." *American Sociological Review* 48(April): 147-160. 1983.
- [8] A. Edström and J. Galbraith, "Transfer of managers as a coordination and control strategy in multinational corporations." *Administrative Science Quarterly* 22: 248-263. 1977.
- [9] S. Ghoshal and C. Bartlett, "Creation, adoption and diffusion of innovations by subsidiaries of multinational corporations," *Journal of International Business Studies*, Fall:365-388.1988.
- [10] O. Granstrand, L. Hakanson, et al. "Internationalization of R&D: A survey of some recent research." *Research Policy* 22: 413-430. 1993.
- [11] O. Granstrand and S. Sjolander, "Internationalization and diversification of multi-technology corporations," *Technology Management and International Business: Internationalization of R&D Technology*. Chichester, John Wiley and Sons. 181-208. 1992.
- [12] E. Herbert, "Japanese R&D in the United States." *Research and Technology management* 32(6):11-20, 1989.
- [13] JETRO, *The 9th survey of European operations of Japanese companies in the manufacturing sector*. JETRO. Tokyo, 1993.

- [14] P. R. Lawrence and J. W. Lorsch, *Organization and environment*. Boston, Harvard Graduate School of Business Administration. 1967.
- [15] J. R. Lincoln, M. Hanada, & K. McBride, "Organizational structures in Japanese and U.S. manufacturing," *Administrative Science Quarterly*, 31: 338-364. 1986.
- [16] E. Mansfield, D. Teece, et al., "Overseas research and development by US based firms." *Economica* 46: 187. 1979.
- [17] Mitsubishi Research Institute, *The Global Strategy of Japanese Corporations*, Tokyo, 1992.
- [18] M. Papanastassiou and R. Pearce, "The internationalization of research and development by Japanese enterprises." *R&D Management* 24(2): 155-165. 1994.
- [19] R. D. Pearce and S. Singh, "Internationalization of research and development among the world's leading enterprises: Survey analysis of organization and motivation," O. Granstrand et.al. (eds.) *Technology Management and International Business: Internationalization of R&D and Technology*. 137-162, 1992.
- [20] R. D. Pearce and S. Singh, *Globalizing Research and Development*. London, Macmillan. 1992.
- [21] C. K. Prahalad and Y. Doz, *The Multinational Mission: Balancing Local Demands and Global Vision*. New York, The Free Press. 1987.
- [22] R. Ronstadt, *Research and Development Abroad by U.S. Multinationals*. NY, Praeger. 1977.
- [23] J. Sigurdson and A. M. Anderson, *Science and Technology in Japan*, London: Longman, 1991.
- [24] J. D. Thompson, *Organizations in Action*, New York: McGraw Hill, 1967.
- [25] E. Von Hippel, "Cooperation between rivals: Information know-how trading." *Research Policy* 16: 291-302. 1987.
- [26] E. Von Hippel, "Trading trade secrets." *Technology Review Feb./March*: 58-64. 1988.
- [27] D. E. Westney, "Cross-Pacific internationalization of R&D by U.S. and Japanese firms." *R&D Management* 23(2): 171-181. 1993.
- [28] D. E. Westney and K. Sakakibara, "Comparative study of the training, careers, and organization of engineers in the computer industry in Japan and the United States." *The MIT Japan Program - Science, Technology, management, MITJP 85-03*: 1992.
- [29] M. Y. Yoshino, *Japan's Multinational Enterprises*. Cambridge, MA., Harvard University Press. 1976.