

# **The evolution of reverse knowledge transfer within multinational corporations**

Paper ID: A108

Larissa Rabbiosi

Politecnico di Milano

Piazza L. da Vinci, 32 - 20133 MILANO - ITALY

Tel. +39 02 2399 3956; Fax. +39 02 2399 2710;

E-mail: [larissa.rabbiosi@polimi.it](mailto:larissa.rabbiosi@polimi.it)

First version, May 2005

## **Abstract**

Reverse knowledge transfer (RKT) within multinational corporations (MNCs) is a focal point of the academic research on the evolution of competitive advantage in MNCs. In particular, drawing upon recent developments in the theory of international business and the knowledge-based view of the firm, the MNC is considered as repository of knowledge and a superior way of organising knowledge transfer across its dispersed but interconnected international network. This approach re-assesses the role played by foreign subsidiaries and stimulates theoretical and empirical research on: (i) processes and mechanisms through which knowledge is managed and transferred within MNCs; and (ii) the effects of RKT on MNC performance. Given the relevance of the phenomenon, this paper reviews and summarises the results of selected studies both on organisational mechanisms adopted within MNCs in order to favour RKT, and on the evidence for the impact of RKT on MNC performance. Therefore, based on the preceding literature review, we develop a conceptual model and we enucleate some research challenges that we think should be met in the near future.

**Topic area:** Internationalization of knowledge

**Key words:** reverse knowledge transfer, MNC performance, organisational design, control and communication mechanisms.

## **1. Introduction**

Over the last decades there has been an upsurge of interest among scholars on the importance of knowledge management in firms as a crucial source of strategic competitive advantage. In particular, with reference to multinational corporations (MNCs), their success is, to an increasing extent, considered to be contingent upon the ease and speed by which knowledge is disseminated throughout the organisation (Hedlund 1986; Bartlett and Ghoshal 1989; Gupta and Govindarajan 1991, 2000; Pedersen et al. 2003). Indeed, the very reason why MNCs exist is that they are efficient vehicles for creating and transferring knowledge across borders.

However, we still have a limited understanding of how MNCs manage knowledge transfer and deploys it effectively. In fact, despite the theoretical relevance of and the practitioners' interest in the MNCs' ability to integrate foreign competences to improve their knowledge base and their performance, very scant research has been conducted on this topic. To date, scholars have studied knowledge transfer mechanisms within MNCs generally looking at control and/or communication mechanisms (Egelhoff 1988; Gupta and Govindarajan 1991, 2000; Nobel and Birkinshaw 1998), and only little attention has received the study of the relationship between knowledge transfer and MNC performance.

Although the empirical research carried out so far highlighted both the occurrence of 'reverse knowledge transfer' (RKT) (Håkanson and Nobel 2001) within MNCs, and the broad set of organisational mechanisms through which it occurs, some crucial issues remain still to be explored. Given the relevance of the phenomenon, this paper reviews and summarises the results of selected studies both on organisational mechanisms adopted within MNCs in order to favour RKT, and on the evidence for the impact of RKT on MNC performance. Thus, based on the preceding literature review, we enucleate some research challenges that we think should be met in the near future.

The rest of the paper is organised as follows. In the next Section, we briefly review prior literature on knowledge transfer providing a comparison of different typologies. Indeed, although the parent company continues to serve as the most active creator and diffuser of knowledge within the corporation (Pearce 1999, Gupta and Govindarajan 2000), i.e. within both its external and internal networks, some recent literature (Cantwell 1995, Fors 1997, Kuemmerle 1999) has acknowledged that MNCs undertake foreign investments not only to exploit their ownership advantages abroad, but also to access local sources of excellence, thus augmenting their existing stock of knowledge. Therefore, also foreign subsidiaries may engage in knowledge transfer with their internal and external networks. In Section 3, from a network-based perspective we review the literature on the relationship between MNC's organisational design and RKT. Specifically, we address the concepts of subsidiary autonomy and subsidiary integration. The Fourth Section reviews empirical studies about the impact of RKT upon the receiving unit's performance. Finally, in the Fifth Section, we develop a conceptual model in order to shed light on the above complex issues and to provide a discussion on research challenges for future theoretical and empirical works.

## **2. Background of the knowledge transfer typologies research stream**

Knowledge is an elusive concept that has been classified and defined in a variety of ways (see e.g. Nonaka and Takeuchi, 1995). We will refer to knowledge that exists in the form of know how, such as product design, business practices, quality issues, distribution expertises, customer handling, and so on. Specifically, we identify knowledge as a set of know-how and capabilities that “refer to a firm’s capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end. They are information based, tangible or intangible processes that are firm specific and are developed over time through complex interactions among the firm’s resources” (Amit and Schoemaker 1993: 35).

Concerning the concept of transfer, the knowledge transfer “connotes the firm’s replication of an internal practice that is performed in a superior way in some part of the organization and is deemed superior to internal alternate practices and known alternatives outside the company” (Szulanski 1996: 28). The word ‘transfer’ emphasises the movement of knowledge within the organisation (Szulanski 1996). Specifically, this movement may take place through the MNC in at least five different forms (e.g. Gupta and Govindarajan 1991): (i) flows from parent company to subsidiaries, (ii) flows from subsidiaries to parent company, (iii) flows from local environment to subsidiary, (iv) flows from subsidiary to local environment, (v) flows to peer subsidiaries<sup>1</sup>.

Traditional approaches to the firm’s multinational growth (Hymer 1960; Vernon 1966; Caves 1974) argue that firms going abroad must possess ownership advantages allowing them to overcome their “liability of foreignness”. From this point of view learning and transferring of knowledge consist of a one-way movement of technologies and methods from parent company to subsidiaries. The creation and exploitation of ownership or firm-specific advantages are the main reasons for the growth of most multinational firms (Caves 1974; Dunning 1977;). The technology generated by the MNC can be used in its home country and/or its foreign subsidiaries to generate rents. Also, due to market imperfections and transaction costs, MNCs prefer to exploit their knowledge-based assets within their own organisations rather than across markets, thus undertaking FDI (Hymer 1960; Vernon 1966; Buckley and Casson 1976; Dunning 1992). Empirical findings show that transfer of tangible and/or intangible assets (like technological knowledge, brand name, capital and organisational capabilities) from the parent company to foreign subsidiaries explain the higher productivity

---

<sup>1</sup> We will refer to the cases (ii) and (v) as ‘reverse knowledge transfer’ (RKT).

of foreign-owned firms than domestically-owned ones (Davies and Lyons 1991; Doms and Jensen 1998; Conyon et al. 2002; Siler et al. 2003).

However, most recent approaches highlight that the relevant international growth of domestic firms might be considered not only as a consequence of their endowment of exclusive advantages exploitable also on foreign markets, but also as a means to access new competitive resources and competences. In other words, being multinational might become the cause rather than the effect of the firms' growth and competitiveness. In this context, a lively debate focusses on the idea that MNCs undertaking Home Based Augmenting investments (rather than Home Based Exploiting, see Kuemmerle (1997; 1999)) gain the access to localised knowledge sources that might improve the whole firm's technological base (Cantwell 1995; Dunning and Narula 1995; Almeida 1996; Zanfei 2000).

Along this line, an important stream of the academic research has looked at the flows of knowledge between the subsidiary and its external network. The argument is often made on the idea that foreign subsidiaries "generate knowledge and innovations in response to stimuli resident in the heterogeneous host-country environments in which they operate" (Frost and Zhou 2000: 11). Indeed, the role played by foreign subsidiaries is essential since they might improve both the technological base and the competitive advantage of the MNC as a whole (Almeida 1996; Birkinshaw et al. 1998; Cantwell and Piscitello 1999). Foreign subsidiaries depend on localised knowledge sources in their own local knowledge generation (Kogut and Chang 1991; Cantwell et al. 2000), and subsidiaries' ability to gain access to local knowledge sources is dependent upon their embeddedness in the host country context and the social relations of technological innovation (Blanc and Sierra 1999; Zanfei 2000; Frost 2001). Therefore, external networks, i.e. the relationships to the local customers, competitors and research institutions, become central for upgrading existing products and technologies, as well as for the creation and development of knowledge concerning new operating procedures and business practices (Pearce and Papanastassiou 1999; Zander 1999)<sup>2</sup>.

However, the re-assessment of the role played by foreign subsidiaries (Birkinshaw 1996) seems to have fostered a new phase, based upon their ability to create an interface between the major localised knowledge and the internal network (Sölvell and Zander 1998; Sölvell and

---

<sup>2</sup> This idea has led to a growing interest in the asset-acquiring motive for FDI (e.g. Cantwell 1989; Kogut and Chang 1991; Dunning 1992; Dunning and Narula 1995; Cantwell and Piscitello 2000), in the greater decentralization in the management of international R&D to capture 'home base augmenting' benefits (Kuemmerle 1997, 1999), and in the subsidiary's ability to generate independent technological capabilities as 'centres of excellence' (Holm and Pedersen 2000; Frost et al. 2002; Foss and Pedersen 2002).

Birkinshaw 2000; Enright 2000). What previously had been separated geographic parts of the company's business (specialised in accordance with the specific local resources and conditions), has been transformed into a more complex integrated organisational network for the creation and development of new knowledge. Drawing upon the knowledge-based and the network-based views, therefore, the MNC is considered as repository of knowledge and a superior way of organising knowledge transfer across its dispersed but interconnected international network (Hedlund 1986; Bartlett and Ghoshal 1989; Kogut and Zander 1992; Cantwell 1995). This process, occurring through "reverse technological transfer" (Håkanson and Nobel 2000; Frost 1998), has stimulated theoretical and empirical research on the processes and mechanisms through which knowledge is managed and transferred within MNCs (e.g. Gupta and Govindarajan 1991). Specifically, it investigates whether, how, and to what extent new knowledge is transferred from foreign subsidiaries back to the parent company or to the other sister units. This process concerns both technological competences (Håkanson and Nobel 2001; Iwasa and Odagiri 2004), tacit know how (Kogut and Zander 1992; Lane and Lubatkin, 1998; Gupta and Govindarajan 2000), and competences related to managerial skills, marketing, production, and organisation (Ghoshal et al. 1994; Kostova 1999; Gupta and Govindarajan 2000; Björkman et al. 2004). Then, the integration of capabilities dispersed in a variety of foreign subsidiaries become an important and strategic task for the corporate management (e.g. Holm and Pedersen 2000; Birkinshaw and Hood 1998; Gupta and Govindarajan 1991, 2000).

Even though it is difficult to add some contributions to one specific research stream (like the contributions presented by Birkinshaw et al. 1998), for the purpose of this literature review it seems appropriate to limit the review to the three typologies presented. We provide a systematic comparison of these typologies of knowledge transfer in Table 1.

Finally, concerning the economic theories below each typologies a briefly explanation is needed. The first current based on hierarchical knowledge flows was dominated by the transaction cost theory which focused on markets versus hierarchies in explaining the existence of firms that operate across borders (e.g. Hymer 1960; Hennart 1982). Secondly, research on geography and cluster theory have suggested the importance of external contacts in the development of new competences and the ability to exploit the economies of locational agglomeration through an interchange with competitors, leading suppliers, customers, related firms, and universities (e.g. Porter 1990; Frost 1998). Finally, the theoretical rationale for the third perspective includes the knowledge-based view (e.g. Kogut and Zander 1992, 1993), the

network theory (e.g. Bartlett and Ghoshal 1989), and theories of the learning organisation (e.g. Hedlund 1986), that are linked together by the idea that a MNC is as repository of knowledge and a superior way of organising knowledge transfer across its international network through vertical and lateral relationships.

**Table 1 – A comparison of knowledge transfer typologies**

	<b>Hierarchical knowledge flow</b>	<b>External knowledge flow</b>	<b>Network knowledge flow</b>
<b>Knowledge flow</b>	One way (from parent to subsidiary)	Two ways (local integration: from foreign subsidiary to its host-country and vice-versa)	Multiple ways (from parent to subsidiary and vice-versa and between peer subsidiaries)
<b>Focus</b>	Exploitation of (home) ownership advantages abroad	Sourcing and harnessing of localised knowledge by foreign based subsidiaries	Network sourcing of assets
<b>Knowledge source</b>	Parent company	Local environment	Network relations
<b>Theory</b>	Transaction cost	Economic geography Cluster theory	Knowledge-based view Network theory Learning organisation theory
<b>Unit of analysis</b>	Parent company	Foreign subsidiary	Multinational network
<b>R&amp;D</b>	Centralised	Dispersed	Integrated (network)
<b>Authors</b>	Buckley and Casson (1976) Caves (1974, 1996) Conyon et al. (2002) Davies and Lyons (1991) Dunning (1977, 1992) Doms and Jansen (1998) Siler et al. (2003) Hymer (1960) Vernon (1966)	Almeida (1996) Birkinshaw et al. (1998) Blanc and Sierra (1999) Cantwell (1989) Cantwell and Piscitello (1999) Cantwell et al. (2000) Frost (2001) Frost et al. (2001) Frost and Zhou (2000) Kogut and Chang (1991) Kuemmerle (1997, 1999) Pearce and Papanastassiou (1999) Zander (1999)	Bartlett and Ghoshal (1989) Björkman et al. (2004) Bresman et al. (1999) Cantwell (1995) Frost (1998) Gupta and Govindarajan (1991, 2000) Hansen (1999) Håkanson and Nobel (2000, 2001) Hedlund (1986) Iwasa and Odagiri (2004) Kogut and Zander (1992) Sölvell and Zander (1998) Sölvell and Birkinshaw (2000) Tsai (2001, 2002)

### 3. Reverse knowledge transfer: the organisational design challenge

The influence of knowledge flows across national and organisational borders on innovative and economic performance for MNCs has suggested conceptual frameworks to improve acquiring and transferring knowledge within MNCs. This included considerations of the growing ability of foreign subsidiaries to create and develop new knowledge, and promoting the exchange of that knowledge within the multinational network (e.g. Hedlund 1986; Bartlett and Ghoshal 1989). In this context, MNC strategic management literature has investigated the organisational design of MNCs that better favours reverse knowledge transfer (RKT). One line of research has emphasised the influence on RKT of formal organisational structures

generally based on control mechanisms (e.g. Nohria and Ghoshal 1994; O'Donnell 2000), another body of research has stressed the benefit of communication mechanisms in facilitating RKT (e.g. Gupta and Govindarajan 1991, 2000). In particular, it is remarkable that the process of transferring knowledge across dispersed units of MNCs has attracted the research interest on the notions of 'subsidiary autonomy' and 'subsidiary integration' (Foss and Pedersen 2002). Indeed, strategic RKT is likely to manifest through specific configurations of organisational design characterised by different degree of autonomy and integration. Specifically, a greater degree of autonomy is often considered positively related with subsidiaries' knowledge creation and development, based on the idea that independent subsidiaries have strategic mandates (Birkinshaw et al. 1998) that favours local responsiveness (Bartlett and Ghoshal 1989) and knowledge development by tapping into local knowledge bases (Cantwell 1995, 1999). On the other hand, because knowledge creation stands to benefit from knowledge residing elsewhere in the MNC, connections and dependency to the rest of the organisation have to be established in order to stimulate and permit the access and transfer of knowledge from different positions (Håkanson and Nobel 2001). A trade off between autonomy, linked with subsidiary's ability to innovate, and integration, linked with subsidiary condition to be a part of the network, introduces a possible contradiction into the MNC's organisational design.

Although much of the research on RKT tends to focus on characteristics of knowledge (Zander and Kogut 1995; Szulanski 1996) and of senders and receivers (Szulanski 1996; Lane and Lubatkin 1998; Gupta and Govindarajan 2000), a growing number of studies has been addressed to the relationship between organisational design and RKT. Specifically, greater attention has been devoted to the degree and type of interdependence between MNC units and the management of that interdependence through control and communication mechanisms, that might support RKT. These aspects are discussed seriatim in the following.

### *3.1. Subsidiary autonomy and control mechanisms*

The MNC management literature has argued that 'formal organisation structure' (see, for a review, Martinez and Jarrillo 1989) influences internal knowledge flows in complex organisations. That formal organisation structure<sup>3</sup> is reflected in the autonomy of the subsidiary managers in making a set of key decisions. Thus, the increasingly importance of subsidiary specialised roles (e.g. Birkinshaw and Hood 1998) is expected to favour the

---

<sup>3</sup> Previous studies identified several elements of formal structure, including centralisation, formalisation and specialisation (e.g. Martinez and Jarillo 1989; Nobel and Birkinshaw 1998).

consequent subsidiary independence from the parent company. In this context, parent company may use tailoring and control mechanisms in order to best manage the subsidiary autonomy and ensure that subsidiary's knowledge is transferred across different units. In particular, applying the agency theory (Jensen and Meckling 1976) to the headquarters-foreign subsidiaries relationship, scholars have investigated the relationship between the allocation of decision rights (authorities and responsibilities) and RKT (Ghoshal et al. 1994; Nobel and Birkinshaw 1998; Tsai 2002). Specifically, in order to support knowledge flows from independent foreign subsidiaries to the rest of the MNC, control mechanisms such as the specification of subsidiary performance evaluation criterion and/or subsidiary management compensation (O'Donnell 2000; Björkman et al. 2004), and the use of expatriate subsidiary managers (Gupta and Govindarajan 2000; O'Donnell 2000; Björkman et al. 2004) might be implemented. Empirical findings suggest that MNC headquarters can impact on RKT by tailoring the criteria used to evaluate subsidiary performance, while conflicting opinions are found for the potential impact of a compensation system for top management based on the regional or global performance of the MNC, as well as of the use of expatriate managers (Roth and O'Donnell 1996; Gupta and Govindarajan 2000; O'Donnell 2000; Björkman et al. 2004). Moreover, while centralised hierarchical structures have a negative effect on knowledge sharing (Tsai 2002), subsidiary autonomy appears to have a positive influence on inter-subsidiaries knowledge flows but any effect on subsidiary-headquarters knowledge flows (Ghoshal et al. 1994).

However, limiting the extent of subsidiary autonomy reduces its ability to learn from local system of innovation and prevents the MNC from benefit of new knowledge developed by independent subsidiaries (Foss and Pedersen 2002).

### *3.2. Subsidiary integration and communication mechanisms*

The literature has highlighted how is extremely complex to identify and transfer knowledge localised elsewhere in the MNC. In that case the existence of intra-firm linkages generally based on trust and personal reciprocity help to recognise where new knowledge does exist and to encourage its sharing and transfer. Specifically, person-based mechanisms (Ghoshal et al. 1994; Nobel and Birkinshaw 1998; Bresman et al. 1999; Gupta and Govindarajan 2000; Håkanson and Nobel 2001; Pedersen et al. 2003; Björkman et al. 2004; Edwards and Ferner 2004), such as inter-unit trips and visits, international committees, teams, task forces, and training involving participants from multiple units, facilitate the development of interpersonal ties in the MNC, which in turn favours RKT. Knowledge can be transferred also by written



media (Pedersen et al. 2003) involving transfer based on manuals, written instructions, and blueprints, as well as by ICT-based mechanisms (Howells 1995). It is worth noting that, although the greater importance and diffusion of person-based mechanisms, the use of information and communication technology (ICT) has still a fundamental role into the international knowledge transfer (Almeida et al. 2002). Indeed, such mechanisms through the inter-units intranets allow the sharing of standardised file formats and communication software, databases, design tools and libraries that assist the movement of knowledge within MNCs.

However, the available evidence indicates that ‘codified communication’ (Buckley and Carter 2004) based on impersonal source such as publications and reports, database or firm’s extensive intranet, is a much less effective way of transferring knowledge than the ‘personal communication’ (Buckley and Carter 2004; Cross and Sproull 2004), and that is more likely when intuitive and experience based knowledge has to be transferred. Indeed, the limitation of written and ICT mechanisms has increasingly pointed to the difficulties of transfer tacit knowledge (Pedersen et al. 2003). The efficient sharing of tacit knowledge is typically characterised by tight coupling between people from different MNC’s units, and to enhance this transfer it is important that each people involved know each other beforehand (Bresnam et al. 1999).

### *3.3. Toward the coexistence of subsidiary autonomy and integration*

Recently, empirical studies have suggested that no single best organisational design of transferring knowledge does exist. MNCs use a variety of mechanisms both to control and to integrate their foreign subsidiaries, with the different mechanisms being predominantly complementary rather than substitutes (e.g. O’Donnell 2000; Björkman et al. 2004). Integration and autonomy will coexist in the architecture of some MNCs. In some instances, the autonomy solution is desirable where it seems to be important tapping into local cluster knowledge through foreign subsidiaries. Instead, when the activities of a foreign subsidiary influence or are influenced by the activities of another subsidiary within the MNC operating in a different country, the control mechanisms may be not the effective ones for eliciting RKT. In similar conditions the integration solution based on coherence of beliefs and widening of collective action is very important for RKT (O’Donnell 2000). Likewise, supposing that useful knowledge exists in the MNC, searching where it resides might be very time-consuming work, if not impossible. Indeed, MNCs are complex organisations that make the search process difficult and uncertain. In this context, become important the existence of

communication mechanisms within the organisation as channels through which useful knowledge and information about opportunities of knowledge use flow (Hansen 1999).

#### **4. Reverse knowledge transfer and performance**

The fact that RKT occurs within MNCs does not necessarily imply that such a transfer is beneficial for the receiving units. Indeed, knowledge transfer implies successful knowledge transfer whether the receiving unit is able to integrate that knowledge in its existing knowledge base and to make use of it (Gupta and Govindarajan 2000; Foss and Pedersen 2002). Many studies have implicitly and positively linked successful RKT and performance. Specifically, the integration and recombination of geographic dispersed knowledge within the MNC foster technological and managerial innovation and create synergies that can significantly leverage MNC performance (e.g. Ghoshal and Bartlett 1990). However, the direct understanding of whether, how, and to what extent, the application of the subsidiary knowledge in other MNC units affects the receiving unit's performance is still far from being reached.

In the R&D research stream, the bulk of the empirical works measures changes in patent activity or analyses patent citations to capture whether a variety of units dispersed across different countries affect the MNCs' innovative performance. Citations are interpreted as knowledge flowing from the inventor/applicant of the cited document to the inventor/applicant of the citing one (e.g. Jaffe et al. 1993). Empirical findings show that MNCs appear to be more innovative thanks to access to a larger stock of ideas through their intra-firm worldwide pool of information. However, up to now the bulk of the literature on this topic has evaluated changes in the innovative activity of foreign subsidiaries (Almeida 1996; Frost 2001; Almeida and Kogut 1999) exploring whether they are likely to draw upon knowledge pool in their local environment. Only some exceptions do exist that appraise foreign affiliates work as a conduit for technological diffusion of localised knowledge to their parent companies and sister units (Frost 1998; Iwasa and Odagiri 2004; Yamin and Otto 2004). Along this line, empirical results show that foreign subsidiaries' contribution to the MNC innovative performance remains modest compared to the technological flow from parent companies to their subsidiaries, enhancing the pattern of technology transfer predicted by traditional theory. However, many criticisms have been levied against the use of patent citation data. For instance, confusion originates from the dissimilar citation roles applied by different patent offices (in particular between the USPTO and the EPO), as well as because

citations may come from the patent examiners rather than from inventors themselves (e.g. Breschi and Lissoni 2004).

Thus, some studies either based on case studies or based on surveys go beyond the above limits and provide useful insights. They suggest that MNCs that undertake R&D abroad will access to foreign localised knowledge, which in turn can be transferred back to the home plants and influencing their performance. Specifically, R&D in foreign affiliates appeared to affect positively the annual growth rate in output for home plants (Fors 1997), as well as R&D performed abroad had a positive impact on productivity in home plants (Mansfield 1984). There is also recent evidence that intra-unit transfer of HRM practices affects the *modus operandi* of the MNC (Edwards and Ferner 2004), the transfer and deployment of tacit overseas knowledge impact on new product development capabilities of the parent unit (Subramaniam and Venkatraman 2001), and that internal learning capacity is important for a unit's ability of introducing new products, but less significant for its business performance (Tsai 2001).

However, the evidence for the impact of RKT on MNC performance is still limited and too scant is academic research that addresses the effectiveness of RKT through direct measures of performance. Although it is hardly possible to isolate benefit from knowledge transfer from other effects on overall performance (Schlegelmilch and Chini 2003), new attempts are needed in order to specify and test the processes or the underlying mechanisms through which units within a MNC receive knowledge from elsewhere in the MNC and improve their performance.

## **5. Implication for further research**

In this Section, we briefly outline on an abstract level some of the research challenges that face research in how RKT may influence MNC's performance by a variety of organisational designs. Figure 1 depicts the various constructs forming the proposed conceptual model. Thus, we elaborate on each of these constructs glimpsing the most important issues that had been explored insofar and we advance some research questions for future empirical testing.

A growing number of studies have explored the subsidiary's ability to engage in knowledge transfer. Indeed, it seems fundamental to control for differing subsidiary mandates since these could affect the amount and the characteristics of knowledge that might be transferred to the other MNC's units (Birkinshaw et al. 1998; Foss and Pedersen 2002; Andersson 2003;

Schlegelmilch and Chini 2003). Moreover, the nature of subsidiary operations<sup>4</sup> (Gupta and Govindarajan 2000) is expected to shape the nature of knowledge flows within the MNC. Nevertheless, foreign subsidiary's knowledge has to be recognised as distinctive by other parts of the MNC and it might be possible to transfer it to elsewhere within the MNC (Birkinshaw et al. 1998). Indeed, the more the knowledge is complex, context specific and tacit in nature, the more difficult is its transfer because its value is limited to its country or domain of operation<sup>5</sup> (e.g. Szulanski 1996).

Whether the subsidiary's distinctive knowledge is transferable then the receiving unit has to possess certain internal capabilities in order to engage in knowledge transfer. Indeed, as the literature review has shown, knowledge transfer is far from being an automatic process, especially when the flow of knowledge goes from the periphery to the centre. The mere existence of knowledge somewhere in the MNC is of little benefit; it becomes a valuable corporate asset only if it is accessible, and its value increase with the level of accessibility (Szulanski 2000). In order to favour RKT, MNCs have to develop an efficient organisational design taking into account both control mechanisms, such as the allocation of decision-making authority, the use of incentives and monitoring systems (Nohria and Ghoshal 1994; O'Donnell 2000), and communication mechanisms (Ghoshal et al. 1994; Nobel and Birkinshaw 1998; Bresman et al. 1999; Gupta and Govindarajan 2000; Björkman et al. 2004; Edwards and Ferner 2004).

However, RKT is a non trivial process also because of the presence of a range of barriers to it. A vivid debate has focused on: the characteristics of knowledge (Zander and Kogut 1995; Szulanski 1996), of knowledge senders and recipients (Szulanski 1996; Lane and Lubatkin 1998; Gupta and Govindarajan 2000) and of knowledge sources (Håkanson and Nobel 2001). Likewise, technological (Zander 1999), cultural (Kostova 1999; Cohen and Levinthal 1990), and geographical distance (Ghoshal and Bartlett 1990) between senders and recipients have been shown to significantly affect RKT. Investing firm motives (Chung 2001) as well as the entry mode on foreign countries (Bresman et al. 1999; Gupta and Govindarajan 2000; Håkanson and Nobel 2001; Björkman et al. 2004) also impact on RKT.

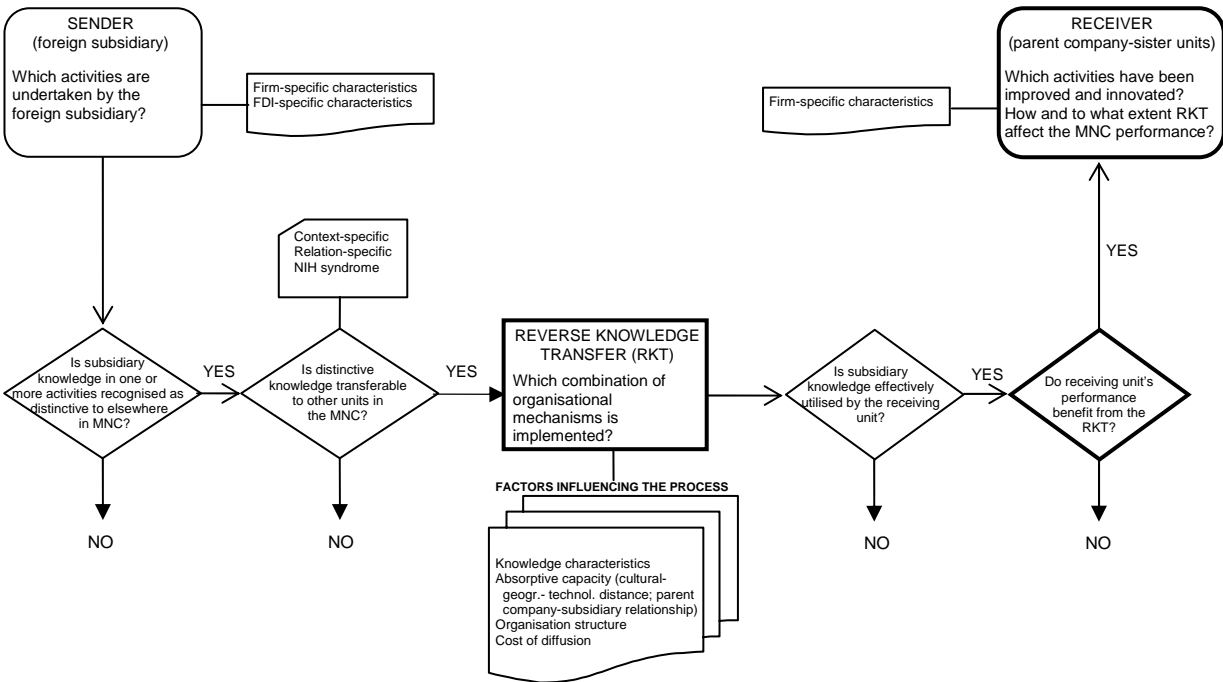
---

<sup>4</sup> Accordingly to Gupta and Govindarajan (2000) it is possible distinguishing between 'primary upstream activities' such as R&D and/or manufacturing, and 'primary downstream activities' such as marketing and sales.

<sup>5</sup> It is worth observing that subsidiary's resources and competences might be 'location bound' (Rugman and Verbeke 1992), thus deeply rooted in the human body and mind that can only be expressed through action, commitment, and involvement in a specific context and locality, or 'not location bound'. These constitute knowledge that potentially may contribute to build the MNC's firm specific advantage.

Summarising, the empirical research carried out so far highlighted both the occurrence of RKT within MNCs, and the broad set of organisational mechanisms through which it occurs. However, some crucial issues remain still to be explored. As showed by the bolded boxes of our conceptual model, two are the research questions that we like to examine: (i) which organisational design is better conducive to RKT? and; (ii) which are the main advantages stemming from the RKT? Specifically, how and to what extent different patterns of RKT might affect MNC performance?

**Figure 1 – The conceptual model**



First, it is necessary to determine how and to what extent MNC managers can design and implement different combinations of organisational mechanisms to best manage the process of sourcing, transferring, integrating and deploying knowledge across different countries. Indeed, it is still far less common the interest for understanding how the receiving unit (parent company or sister units) recognises, acquires, and adopts the valuable knowledge embedded in the foreign subsidiaries. In order to favour the acquisition of novel and more distant knowledge, firms must explore more distant technological domain, yielding innovations with more impact on a broader set of technological areas. In this case, a greater degree of autonomy held by the subsidiary might favour its explorative mandate. However, due to the greater diversity of technological knowledge sources available to the subsidiary from the rest

of the MNC, the intra-MNC cross fertilisation of ideas through RKT must require a greater degree of integration, favouring the development and the application of communication mechanisms to access and incorporate that knowledge.

Moreover, even though nowadays there is some acknowledgement that personal communications are the best mechanisms to transfer skills and the highly specific technical or scientific knowledge, much less agreement exists on the characteristics of those mechanisms: how often do they need to be utilised? How many and which typology of employees (managers, professionals, etc.) do they need to involve? And so on. Therefore, on the empirical side, we suggest to employ more fine-grained operationalization of some constructs used in previous research.

Second, it is necessary to investigate how and to what extent RKT affects technological and non-technological activities and practices, and performance of the receiving unit. **Indeed,** tapping the subsidiaries' distinctive competences in different countries can lead MNCs to initiatives which enhance the creation and development of new product, technology, managerial and marketing practices, and so on. Conceptually, new studies should seek to advance the debate surrounding RKT and MNC performance within the MNC strategic management literature. Specifically, exploring the transfer of a broad range of knowledge and directly measuring the impact of RKT on the receiving unit's ability to create and develop new competences in a broad set of technological and non-technological activities. Likewise, investigating how that effects work as a conduit for the improvement of the MNC's economic performance, such as growth, market share and operating margin.

As far as the methodology, the international literature has so far investigated the largest MNCs' behaviour mainly through case studies (Bresman et al. 1999; Edwards and Ferner 2004) or patent citation analyses, especially in the US context (Almeida 1996; Frost 1998). However, while the former allows rich insights into a small number of cases, with the obvious limitation for generalization across MNCs, the latter generally focuses on codified knowledge and hence it does not entirely capture tacit knowledge. In order to learn more about the complex interaction between RKT, organisational design and performance, we believe that future empirical works need to rely both on detailed in-field analysis based on case-study research, and on extensive data set collected through survey analysis.

Finally, we want to stress that the above research questions are expected to shed some preliminary light on the importance of outward FDI as a means of technological catching up. This might reveal particularly relevant especially for developed countries, where multinational

growth might be considered as a means to tap into the capabilities available in the host country thus, at least partially, overcoming poor domestic innovative performance and competitive problems.

## 6. References

- Almeida P. 1996. Knowledge sourcing by foreign multinationals: patent citation analysis in the US semiconductor industry, *Strategic Management Journal* 17: 155-165.
- Almeida, P., Kogut B. 1999. Localization of knowledge and the mobility of engineers in regional Networks, *Management Science*, 45: 905–917.
- Almeida P., Song J., Grant R.M., 2002. Are firms superior to alliances and markets? An empirical test of cross-border knowledge building, *Organization Science*, 13(2), 147-161.
- Amit R., Schoemaker P., 1993. Strategic assets and organizational rent, *Strategic Management Journal*, 14, 33-46.
- Andersson U. 2003. Managing the transfer of capabilities within multinational corporations: the dual role of the subsidiary, *Scandinavian Journal of Management*, 19, 425-442.
- Bartlett C.A., Ghoshal S. 1989, *Managing across Borders: The Transnational Solution*. Boston: Harvard Business School Press.
- Birkinshaw, J., 1996. How multinational subsidiary mandates are gained and lost, *Journal of International Business Studies*, 27(3): 467-496.
- Birkinshaw, J., Hood, N., 1998. Multinational subsidiary evolution: capability and charter change in foreign-owned subsidiary companies, *Academy of Management Review*, 23(4 ): 773-795.
- Birkinshaw, J., Hood, N., Jonsson S., 1998. Building firm-specific advantages in multinational corporations: the role of subsidiary initiative, *Strategic Management Journal*, 9: 221-241.
- Björkman I., Barner-Rasmussen W., Li L., 2004. Managing knowledge transfer in MNCs: the impact of headquarters control mechanisms, *Journal of International Business Studies*, 35: 443-455.
- Blanc, H., Sierra C.1999. The internationalisation of R&D by multinationals,: a trade-off between external and internal proximity, *Cambridge Journal of Economics*, 23: 187-206.
- Breschi S., Lissoni F., 2004. Knowledge networks from patent data: methodological issues and research targets, Cespri WP n. 150.
- Bresman H., Birkinshaw J., Nobel R. 1999. Knowledge transfer in international acquisitions, *Journal of International Business Studies*, 30: 439-462.
- Buckley P.J., Carter M.J., 2004. A formal analysis of knowledge combination in multinational enterprises, *Journal of International Business Studies*, 35, 371-384.
- Buckley P., Casson M. 1976. *The Future of Multinational Enterprise*. London; MacMillan.
- Caves, R.E., 1974. Multinational firms, competition and productivity in host-country markets, *Economica* 32, pp. 176-93.
- Cantwell J.A., 1989. *Technological innovation and multinational corporations*, Oxford: Basil Blackwell.
- Cantwell J. A., 1995. The globalisation of technology: what remains of the product cycle model? *Cambridge Journal of Economics*, 19: 155-174.
- Cantwell J.A., 1999. From the early internationalisation of corporate technology to global technology sourcing, *Transnational Corporations*, 8(2): 71-92.
- Cantwell J.A., Iammarino S., Noonan C., 2000. Sticky places in slippery space: the location of innovation by MNCs in the European regions, in N. Pain (ed.), *Inward investment, technological change and growth*, Lodon: Macmillan.

- Cantwell J. A., Piscitello L., 1999. The emergence of corporate international networks for the accumulation of dispersed technological competences, *Management International Review*, 39: 123-147.
- Cantwell J.A., Piscitello L., 2000. Accumulating technological competence: its changing impact on corporate diversification and internationalisation, *Industrial and Corporate Change*, 9(1): 21-51.
- Chung W., 2001. Identifying technology transfer in foreign direct investment: influence of industry conditions and investing firm motives, *Journal of International Business Studies*, 32: 211-229.
- Cohen W., Lenvinthal D., 1990. Absorptive capacity: a new perspective on learning and innovation, *Administrative Science Quarterly*, 35:128-152.
- Conyon M.J., Girma S., Thompson S., Wright P.W., 2002. The productivity and wage effect of foreign acquisition in the United Kingdom, *The Journal of Industrial Economics*, 50: 85-102.
- Cross R., Sproull L., 2004. More than an answer: information relationships for actionable knowledge, *Organization Science* 15(4), 446-462.
- Davies S.W., Lyons B.R., 1991, Characterising relative performance: the productivity advantage of foreign-owned firms in the UK, *Oxford Economic Papers (new series)*, 43: 584-595.
- Doms M., Jensen B.J. 1998, *Comparing wages, skills, and productivity between domestically and foreign-owned manufacturing establishments in the United States*, in Baldwin R.E., Lipsey R.E., Richardson J.D. (eds.), *Geography and ownership as bases for economic accounting*, Studies in Income and Wealth, 59, 235-255.
- Dunning JH. 1977. Trade, location of economic activity and the MNE: a search for an eclectic approach. In *The international allocation of economic activity*, Ohlin B, Hesselborn P, Wijkman P (eds.). MacMillan: London.
- Dunning J.H, 1992. *Multinational enterprise and the global economy*, Wokingham: Addison-Wesley.
- Dunning J.H, Narula R. 1995.The R&D activities of foreign firms in the United States, *International Studies of Management and Organization*, 25:39-73.
- Edwards T., Ferner A., 2004. Multinational, reverse diffusion and national business systems, *Management International Review*, 1: 49-79.
- Enright M., 2000. Regional clusters and multinational enterprises: independence, dependence or interdependence?, *International Studies of Management and Organization*, 30(2) 114-138.
- Foss N.J., Pedersen T, 2002. Transferring knowledge in MNCs: the role of sources of subsidiary knowledge and organization context, *Journal of International Management*, 8, 49-67.
- Fors G., 1997. Utilization of R&D results in the home and foreign plants of multinationals, *Journal of Industrial Economics*, XLV(2): 341-358.
- Frost T., 1998. The geographic sources of innovation in the multinational enterprise: U.S. subsidiaries and host country spillovers, 1980-1990, Unpublished Ph.D. thesis, Massachusetts Institute of Technology.
- Frost T., 2001. The geographic sources of foreign subsidiaries' innovations, *Strategic Management Journal*, 22:101-123.
- Frost T., Zhou C., 2000. The geography of foreign R&D within a host country, *International Studies of Management and Organization*, 30(2), 10-43.
- Frost T., Birkinshaw J.M., Ensign P.C., 2002. Centers of excellence in multinational corporations, *Strategic Management Journal*, 23(4), 997-1018.



- Ghoshal S., Bartlett C. A., 1990. The multinational corporation as an interorganizational network, *Academy of Management Review*, 15: 603–625.
- Ghoshal S., Korine H., Szulanski G., 1994. Interunit communication in Multinational Corporations, *Management Science*, 40(1): 96-110.
- Gupta, A. K., Govindarajan V., 1991. Knowledge flows and the structure of control within multinational corporations, *Academy of Management Review*, 16(4): 768–792.
- Gupta A.K., Govindarajan V. 2000. Knowledge flows within multinational corporations, *Strategic Management Journal*, 21: 473-496.
- Håkanson L., Nobel R., 2000. Technology characteristics and reverse technology transfer, *Management International Review*, 40: 29-48.
- Håkanson L., Nobel R., 2001 Organization characteristics and reverse technology transfer, *Management International Review*, Special Issue, 41(4): 392-420.
- Hansen M., 1999. The search-transfer problem: the role of weak ties in sharing knowledge across organisational subunits, *Administrative Science Quarterly*, 44, 82-111.
- Hedlund, G., 1986. The hypermodern MNC - A heterarchy?, *Human Resource Management*, 25: 9-25.
- Hennart J-F., 1982. *A theory of the multinational enterprise*. University of Michigan Press, Ann Arbor, MI.
- Holm, U. and Pedersen, T., 2000. *The emergence and impact of MNC centres of excellence: A subsidiary perspective*. London: McMillan.
- Howells J.R., 1995. Going global: the use of ICT networks in research and development, *Research Policy*, 24: 169-184.
- Hymer S.H., 1960, *The international operations of national firms: a study of direct investment*. PhD Thesis, MIT, published 1976, Cambridge MIT Press.
- Iwasa T., Odagiri H., 2004. Overseas R&D, knowledge sourcing, and patenting: an empirical studies of Japanese R&D investment in the US, *Research Policy*, 33:807-828.
- Jaffe A., Trajtenberg M., Henderson R., 1993. Geographic localisation of knowledge spillovers as evidenced by patent citations, *Quarterly Journal of Economics*, August, 577-598.
- Jensen M.C., Meckling W.H., 1976. Theory of the firm: managerial behavior, agency cost and ownership structure, *Journal of Financial Economics*, 3, 305-360.
- Kogut B., Chang S.J., 1991. Technological capabilities and Japanese foreign direct investment in the United States, *Review of Economics and Statistics*, 73: 401-413.
- Kogut B., Zander U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology, *Organization Science*, 3: 383-397.
- Kogut B., Zander U. 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation, *Journal of International Business Studies*, 22:625-645.
- Kostova T. 1999. Transnational transfer of strategic organisational practices: a contextual perspective, *Academy of Management Review*, 24: 308-324.
- Kuemmerle W. 1997. Building effective R&D capabilities abroad. *Harvard Business Review* March-April, 61-70.
- Kuemmerle W. 1999. The drivers of foreign direct investment into research and development: and empirical investigation. *Journal of International Business Studies*, 30(1): 1-24.
- Lane, P.J., Lubatkin, M., 1998. Relative Absorptive Capacity and Internorganizational Learning, *Strategic Management Journal*, Vol. 19:461-477.
- Mansfield E., 1984. R&D and innovation: some empirical findings, in Z. Griliches (ed.), *R&D, patents and productivity*. Chicago and London: The University of Chicago Press and NBER.
- Martinez J. I., Jarillo J. C., 1989. The evolution of research on co-ordination mechanisms in multinational corporations, *Journal of International Business Studies*, 3: 489–514.

- Nobel, R & Birkinshaw, J., 1998. Innovation in multinational corporations: control and communication patterns in international R&D operations. *Strategic Management Journal* 19: 479-496.
- Nonaka, I., Takeuchi, H., 1995. *The Knowledge-Creating Company*, Oxford University Press, Oxford.
- Nohria N., Ghoshal S., 1994. Differentiated fit and shared values: alternatives for managing headquarters-subsidiary relations, *Strategic Management Journal*, 15(6), 491-502.
- O'Donnell S.W., 2000. Managing foreign subsidiaries: agents of headquarters, or an interdependent network?, *Strategic Management Journal*, 21(5): 525-548.
- Pearce R.D., 1999. The evolution of technology in multinational enterprises: the role of creative subsidiaries, *International Business Review*, 8: 125-148.
- Pearce, R.D., Papanastassiou M. 1999. Overseas R&D and the strategic evolution of MNEs: evidence from laboratories in the UK, *Research Policy*, 28: 23-41.
- Pedersen T., Petersen B., Sharma D. D., 2003. Knowledge transfer performance of multinational companies, *Management International Review*, 43(3): 69-90.
- Porter M.E., 1990. *The competitive advantage of Nations*. Free Press, New York.
- Roth K., O'Donnell S., 1996. Foreign subsidiary compensation strategy: an agency theory perspective, *Academy of Management Journal*, 39, 678-703.
- Schlegelmilch B.B., Chini T.C., 2003. Knowledge transfer between marketing functions in multinational companies: a conceptual model, *International Business Review*, 12: 215-232.
- Siler P., Wang C., Liu X., 2003. Technology transfer within multinational firms and its impact on the productivity of Scottish subsidiaries, *Regional Studies*, 37(1): 15-25.
- Sölvell Ö., Zander I., 1998. International diffusion of knowledge: isolating mechanisms and the role of MNE, in Chsnlder, Hagström, and Sölvell (eds.), *The dynamic firm*. Oxford University Press: Oxford.
- Sölvell Ö., Birkinshaw J.M., 2000. Leading edge multinationals and leading edge clusters, *International Studies of Management and Organization*, 30(2), 3-10.
- Subramaniam M., Venkatraman N., 2001. Determinants of transnational new product development Capability: testing the influence of transferring and deploying tacit knowledge, *Strategic Management Journal*, 22: 359-378.
- Szulanski, G., 1996. Exploring internal stickiness: impediments to the transfer of best practice within the firm, *Strategic Management Journal*, 17: 27-43.
- Szulanski G., 2000. The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes*, 82: 9-27.
- Tsai W., 2001. Knowledge transfer in interorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance, *Academy of Management Journal*, 44(5): 996-1004.
- Tsai W., 2002. Social structure of "coopetition" within a multiunit organization: coordination, competition, and intraorganizational knowledge sharing, *Organization Science*, 13(2), 179-190.
- Vernon R. 1966, International investment and international trade in the product cycle, *Quarterly Journal of Economics*, 80: 190-207.
- Yamin M., Otto J., 2004. Patterns of knowledge flows and MNE innovative performance, *Journal of International Management*, 10, 239-258.
- Zander I. 1999. How do you mean global? An empirical investigation of innovation networks in the multinational corporations, *Research Policy*, 28:195-213.
- Zander U., Kogut B., 1995. Knowledge and the speed of the transfer and imitation of organization capabilities: An empirical test. *Organization Science*, 6(1): 76-92.
- Zanfei A., 2000. Transnational firms and changing organisation of innovative activities, *Cambridge Journal of Economics*, 24: 515-554.