

SPACES online

Spatial Aspects Concerning Economic Structures

Johannes Glückler

The creation and diffusion of controversial innovations at the organizational periphery



UNIVERSITY OF
TORONTO



RUPRECHT-KARLS-
UNIVERSITÄT
HEIDELBERG
EXZELLENZUNIVERSITÄT

Issue 2010-06 | Volume 8
www.spaces-online.com

Please quote as Glückler, J. (2010): The creation and diffusion of controversial innovations in the organizational periphery. SPACES online, Vol. 8, Issue 2010-06. Toronto and Heidelberg: www.spaces-online.com.

Author Johannes Glückler, Department of Geography, University of Heidelberg, Berliner Str. 48, 69120 Heidelberg, Email: glueckler@uni-hd.de

Keywords knowledge transfer, transnational corporation, innovation, social network analysis, periphery, Argentina

JEL codes D58, L14, L20, L65, M16, Z13

Abstract

This paper focuses on the relationship between center and periphery of transnational corporations in the context of learning and innovation. Traditionally, large corporations exported their technologies and products to remote markets simply to exploit existing competitive advantage and to increase sales. The relationship often used to be one-way because the voice of peripheral markets was usually not echoed in the technology developing center. Today, however, clients have become increasingly valuable not only as consumers but also as sources of learning and innovation. The paper investigates the significance of the organizational and geographical periphery for the innovation process in BASF, a leading global chemical corporation, in the context of Argentina. While operations in this country contribute less than one percent to the global revenues of BASF this research provides evidence on how a peripheral part of the organization may take an important role from a knowledge perspective. Based on a social network survey of knowledge exchange and qualitative interviews with employees at different Argentinean sites of BASF, the paper identifies some of the conditions and mechanisms of the creation of controversial innovation and its diffusion from the periphery towards the global center.

Editors: Harald Bathelt, Johannes Glückler

Managing Editor: Heiner Depner

ISSN: 1612-8974

© 2010 SPACES online. The authors maintain full copyright of the papers.

The creation and diffusion of controversial innovations at the organizational periphery

1 Introduction

Transnational corporations (TNCs) entail complex organizational geographies. They respond to market opportunities by organizing work in a spatial division of labor and in multi-local organizational units. Geographical separation, however, imposes opportunity costs on the knowledge base of an organization. If localized knowledge fails to circulate between the distributed sites of a firm the organization bears unrealized profits from the failure to leverage and reutilize this expertise in other contexts and places. In addition to the problem of detecting, circulating and reusing localized knowledge, there is a second organizational problem that together define the 'knowledge leveraging paradox' (Coff *et al.* 2006): It describes the paradox of leveraging knowledge within the firm and retaining its inimitability vis-à-vis competitors at the same time. Though transferring knowledge between units of the same organization is easier than transferring knowledge across different firms (Almeida *et al.* 2002; Inkpen and Tsang 2005), most organizations still suffer from the best practice puzzle (Szulanski 2003). Organizational units endowed with similar resources, assigned with identical tasks and operating at the same productivity levels still tend to have very different outcomes. Correspondingly, Porter states that "the mere hope that one business unit might learn something useful from another is frequently a hope not realized" (Porter 1985: 352).

Over the last two decades, management and organization science has focused on the antecedents and consequences of knowledge transfer in numerous conceptual and empirical studies. A recent meta-analysis reassessed the empirical associations over a sample of 75 academic studies and found strong support of the positive effect of knowledge transfer on both, innovation and organizational performance (van Wijk *et al.* 2008). Hence, transnational firms should commit efforts to leverage localized expertise within the corporate network of operations. The management literature has analyzed multiple facets of knowledge transfer but neglected the role of geography for knowledge circulation. Though there is increasing research on the relation between transfer barriers and spatial distance, this research still lacks an appraisal of the particularities of places and treats geography as an abstract space of metric distance rather than a space of qualities and varying contextuality. Unfortunately, geographical analysis of the firm and intra-firm processes has also been a wasteland for many years (Maskell 2001). When in the late 1950s McNee pioneered a geography of enterprise (Krumme 1969; McNee 1958), the new interest for corporate decision making was resisted by traditional economic geography: "We have no more interest in the production process inside a factory than has an economic theorist. What we are mainly interested in (...) is what comes in the back door and what goes out the front door of a plant, so that we may know why it is located where it is and what its effect on the area under study is" (Ullman 1953: 55). Unfortunately, the geography of enterprise has not blossomed to maturity since then and economic geography has largely passed by the dynamics of the intra-firm creation and circulation of knowledge.

This paper wants to help closing this gap and focuses on the role of the periphery for corporate learning and innovation. Transnational corporations are distributed across the globe and maintain subsidiaries even in remote, small and developing regions of the world economy, where the contribution of a peripheral country to global revenues is often minimal. Usually, this kind of periphery is given little attention and is often seen as a remote sales channel for products developed in the core of the corporation. This commonsense view of periphery may be problematic in the context of a knowledge-based perspective of the firm (Grant 1996) and its potentials for mobilizing localized knowledge. The competitive advantage of transnational firms may rest on their ability to use also a reverse flow of capabilities from foreign subsidiaries:

“In some companies, where all organizational resources are centralized and where the national subsidiaries are seen as mere delivery pipelines to supply the organization's value-added to different countries, diverse learning may not take place either because the subsidiaries may not possess appropriate sensing, analyzing, and responding capabilities to learn from their local environments, or because the centralized decision processes may be insensitive to knowledge accumulated outside the corporate headquarters” (Ghoshal 1987: 432)

The focus of this paper is on innovation other than strategically planned high-tech research and development (e.g. Bas and Sierra 2002; Cantwell and Santangelo 2002; Kuemmerle 1997, 1999; Patel and Vega 1999). It takes an interest in the transfer and circulation of knowledge generated in the periphery where, often, no R&D departments exist. Instead, new knowledge may also emerge from close customer relations (Grabher *et al.* 2008) as well as from intra-organizational exchange of expertise between professionals (*anonymous source*). This paper explores the subsidiary of the German chemical corporation BASF in Argentina. The Argentinean subsidiary contributes less than one percent of sales to the revenues of BASF. Moreover, the economic depression following the default in 2001 unsettled the trust of foreign investors and led to a further decline of the country vis-à-vis the stable growth of the adjoining Brazilian economy. In what follows, this research challenges the seemingly depressive image of periphery. Do subsidiaries simply roll out existing products and contribute only a minimal fraction to global corporate sales? Or do peripheral subsidiaries occupy a specific position in the corporate network that facilitates local learning, innovation and, eventually, reverse transfer to the core and other lateral parts of the global corporation? This paper conceptualizes a new understanding of periphery (section 2), theorizes the opportunities and enabling conditions for the periphery to create and diffuse innovation (section 3), illustrates an example of successful controversial innovation from qualitative fieldwork (section 4), and explores the structural antecedents of the creation and transfer of knowledge in the periphery (section 5). Section 6 concludes the analysis.

2 Periphery, innovation and knowledge transfer

Intuitively, periphery is an inherently spatial notion. It refers to the outside boundary of a surface or an object. In economic and social science, however, this term has been used in different connotations for many different contexts. The problem is that often the term is vaguely or not clearly defined (Borgatti and Everett 1999; Langholm 1971). This section develops the elements of the concept of periphery in the context of globally distributed firms. In what follows, a peripheral subsidiary is conceived as an organizational unit located in an emerging or developing economy and ideally characterized by limited size, geographical remoteness, topological farness, sparse connectivity, and hierarchical subordination to a coordinating center within a network of corporate communication and reporting relations. The four elements of this definition of periphery are discussed in the following paragraphs.

2.1 Development: The economic dimension of periphery

Theories of economic imperialism (Galtung 1971), *dependencia* (Palma 1978; Prebisch 1959, 1986) or world-system theory divide the world economy in a global center and a periphery whose economic development depends on the center (Mabogunje 1980). The role of TNCs in the economic periphery has been discussed predominantly in the context of *dependencia* theory (Evans 1981; Moran 1978). It argues that the penetration of MNEs in peripheral countries does have long-term negative effects for the host economy as demonstrated by statistical effects of FDI stocks on economic growth and income inequality (Bornschier 1980; Chase-Dunn 1975) as well as by the creation of the ‘technological dependence syndrome’ through the practice of technology licensing (Mytelka 1978). The key argument about the division of the world economy in a center and a periphery was supported by an empirical analysis that clustered all countries according to the four main crite-

ria implied in Galtung's theory: underdevelopment, inequality, trade in raw materials, and feudal trade (Gidengil 1978). Emerging or developing countries are usually not sources of technological innovation and progress. Research in economic geography has extended centre-periphery theory to the geographical scale of regions. Here, center-periphery models are employed to distinguish highly developed central regions from peripheral regions which are remote to the center and suffer inferior economic development (Krugman 1991; Richardson 1978). Transnational corporations will therefore not seek strategic knowledge assets in the periphery. If, in addition, developing economies are rather small markets, the lack of scale economies further reduces the overall attractiveness of the periphery as final or factor markets. Empirical research suggests that knowledge outflows from subsidiaries to the headquarter increase with the level of economic development in the host country (Ambos *et al.* 2006; Gupta and Govindarajan 2000). Peripheral locations with lower levels of development are therefore less likely to contribute innovative knowledge to the corporation.

2.2 Remoteness: The geographical dimension of periphery

The term periphery refers to the geometric fringe of a surface and thus entails an inherent concept of spatial remoteness. Interestingly, the importance of geographical distance for the intra-firm transfer of knowledge has nearly exclusively been analyzed in organization studies (e.g. Ambos and Ambos 2009; Ambos, Ambos, and Schlegelmilch 2006; Borgatti and Cross 2003; Gupta and Govindarajan 2000; Hansen and Lovas 2004) and received only limited attention in geography. Empirical research on intra-firm knowledge transfer suggests that generally, knowledge flows between project teams and other organizational units increase with the relatedness of competences, motivation, absorptive capacity as well as organizational and geographical proximity (e.g. Hansen and Lovas 2004). In turn, knowledge flows decay with geographical remoteness (Ambos and Ambos 2009). Apart from its direct effect on the propensity for knowledge transfer, physical distance has also been studied as a moderating effect: Hansen and Lovas analyzed knowledge transfer between project-teams in different subsidiaries of an electronics corporation and demonstrated that geographical distance between related competences favors the exchange between partners of unrelated competencies in geographical proximity. Further they found that informal networks of interpersonal relationships compensated for geographical distance and enabled knowledge transfer between remote subsidiaries (Hansen and Lovas 2004). There seems to be an association between remoteness to the developed economies and the characteristic of economic underdevelopment mentioned above (Leamer and Storper 2001). This association is reflected in the gravity model which is "possibly the only important finding that has fully withstood the scrutiny of time and the onslaught of econometric technique" (Leamer 2007: 110). It states that the trading volume between any two countries is proportional to the product of their GDP divided by the geographical distance between them. Empirical trade statistics lend full support to the gravity model. It thus relates economic development with the notion of remoteness: countries remote to the rest of the world economy sustain barriers to economic development which qualify them as the periphery.

2.3 Subsidiarity: The organizational dimension of periphery

From the organizational perspective, periphery refers to the subordination, dependence and inferior level of power in relation to the organizational center. Research in organization studies is replete with illustrations of the constraints of innovation transfer between the core of organizations and their (hierarchical) periphery. A particularly critical account and pictorial evidence is given by Yanow (2004): she argues that organizations are far too reluctant to listening to lower level employees and thus often reinvent the wheel although the solution might already be there. She develops the concept of the double periphery where local knowledge is found in communities of practitioners (Yanow 2004). These communities are peripheral in terms of hierarchy and geography. Management often ignores their knowledge and instead of asking and listening to people within the organization they prefer to contract external advisors to develop expert solutions (Yanow 2004). Birkinshaw

and Ridderstråle suggest the metaphor of the ‘corporate immune system’ which entails the totality of defense mechanisms for corporations to resist change induced from the periphery (Birkinshaw and Ridderstråle 1999). One of the reasons why subsidiary initiatives are rather rare events and why central management resists peripheral initiatives is that headquarters expect their subsidiaries to accomplish with their (routine) tasks and not to initiate change. Gupta and Govindarajan analyzed a large data base of 374 subsidiaries of 75 MNCs headquartered in the U.S., Europe, and Japan and found evidence for traditional forward knowledge transfer (from headquarter to the subsidiaries) as being the most frequent and dominant direction of knowledge flow (Gupta and Govindarajan 2000). They conclude that “the parent corporation continues to serve as the most active creator and diffuser of knowledge within the corporation” (Gupta and Govindarajan 2000, 490). This paper aims at integrating organizational (subsidiarity) and geographical elements (remoteness) of periphery and it tries to develop an understanding of how peripheral innovation may emerge and reversely diffuse through the corporate network.

2.4 Farness: The topological dimension of periphery

The core-periphery conception in network theory entails the notion of a dense, cohesive core and a sparse, unconnected periphery (Borgatti and Everett 1999). The basic approach is to identify core actors such that the density of contacts within this core is maximized and the density between peripheral actors is minimized. Peripheral actors, then, are ideally disconnected from each other and only sparsely connected to the network core. One way to observe a peripheral position is the concept of farness (Christley *et al.* 2005). It is the sum of the shortest path lengths from one actor to all other actors in a network. Farness is a consequence of sparse connection with other parts of the network. Instead of using multiple direct linkages to access different regions of a network at short length, far actors always have to use the same few chokepoint relations to reach all other actors over long paths of contacts. Empirically, far actors have been proved to be less innovative, to experience inferior performance and to receive less pecuniary rewards in organizations (e.g. Burt 2004; Owen-Smith and Powell 2004; Tsai 2001). Farness and sparse connectivity are elements of a peripheral integration in a network of relations. However, there is some evidence that the periphery may indeed be innovative exactly because of the characteristics as periphery. Section 3 explores conceptual accounts that theorize the enabling conditions of peripheral innovation.

3 Peripheral innovation and reverse knowledge transfer

3.1 Creation of peripheral knowledge: alleviated inertia

One approach to peripheral innovation can be inferred from organizational ecology and the concept of structural inertia (Hannan and Freeman 1993). Within the ecology framework, organizations are structures for accomplishing collective action as well as repositories of corporate resources (Hannan and Freeman 1984). Organizations exist because they survive environmental selection through adaptation. In contrast to other approaches, organizational ecology does not believe that organizations exist because they are more efficient than alternative forms of facilitating collective action (e.g. markets or ad-hoc collective action). Instead, they assume that organizations persist because their outcomes are reliable over time and because their way of operating ensures accountability. Organizations establish procedural norms and documentation which enable them to provide rational accounts for their action. Both, reliability and accountability reduce the uncertainty of expectations from the environment and create legitimacy for the organization: “We argue that the modern world favors collective actors that can demonstrate or at least reasonably claim a capacity for reliable performance and can account rationally for their actions” (Hannan and Freeman 1984: 153).

The only way for an organization to perform reliably and to account rationally for its action is to be highly reproducible. The need to ensure high levels of reproducibility of organizational structure, in turn, incurs a strong pressure for inertia. Ecological selection thus favors organizations that are able to maintain inert structures. The argument receives empirical support from entrepreneurship research because mortality rates decline with both, size and age of an organization. From this line of argument Hannan and Freeman infer that any attempt to change an organization lowers its reliability of performance and increases its mortality. Reorganization and innovations affecting the organizational core reduce the life expectancy of an organization (Hannan and Freeman 1984)¹. Institutional theory supports this line of argument and uses empirical evidence to demonstrate the illegitimacy of innovation that large organizations put so much effort to resist (Dougherty and Heller 1994).

In the case of drug development in the pharmaceutical industry, for instance, Thomke and Kuemmerle (2002) found that those parts of the corporation that were highly invested in traditional medicinal technologies were most reluctant to and even felt threatened by new technologies. In contrast, the peripheral parts of organizations were quick to respond to technological change (Thomke and Kuemmerle 2002). Their research combines the concept of structural inertia with the perspective of core and periphery in the corporate hierarchy: “peripheral parts of an organization that make links with its environment face less moral and political opposition than parts that are its core; the reason being that changes at the periphery raise fewer fundamental questions about the nature of the organization itself than changes at the core. In the context of drug development, alliance formation with outside partners was peripheral to large firms whereas the project level adoption of new combinatorial chemistry and high-throughput technologies raised some fundamental questions about the role of chemists at the firm's core” (p. 631).

3.2 Diffusion of controversial knowledge: peripheral dominance

In network theory, the diffusion of knowledge and innovation has been modeled differently. Diffusion refers to the process of communicating information about an innovation among the members of a social system (Rogers 1995). These models reflect the contingent conditions of network structure and the actual innovation to be diffused within these structures (McGrath and Krackhardt 2003). Among these models, two are particularly interesting in the context of peripheral innovation. The first is the external-internal (E-I) model. Essentially, it argues that the likelihood for knowledge to diffuse increases with the number of relationships external to the local group of actors. The E-I model is easy to apply in practice by measuring the corresponding E-I-index². In reality it is quite difficult to find positive E-I index values because the co-location – geographical or organizational – promotes the emergence of internal relations for at least two reasons (Krackhardt and Stern 1988): (i) according to the empirically supported law of propinquity (Allen 1977) the probability of two people to establish a communication relation is inversely proportional to the distance between them (Krackhardt 1994). (ii) Even if people are distributed across various locations, organizational task dependence favors or even requires communication within the organizational units (McGrath and Krackhardt 2003). Repeated student experiments lend evidence for the E-I model and demonstrate that the diffusion of knowledge improves

¹ Hannan and Freeman also consider situations in which the environment is unstable, turbulent and changes quickly. In this case, the selective pressure may not so much favor reliability, accountability and inertia but it may promote flexibility and rapid opportunity-taking. Selection does not necessarily favor inertia and the nature of the selection process depends very much on the dynamics and uncertainty of the environment (Hannan and Freeman 1984). Empirical research supports this argument and demonstrates that change may not always increase the failure rate of an organization but may even enhance performance (Haveman 1992). The relation between inertia, change and organizational performance is therefore contingent on environmental conditions.

² EI Index = $(EL - IL) / (EL + IL)$, where *EL* = number of ties that cut across group boundaries, and *IL* = number of ties that connect people within the same group. EI varies between minus one (all relations within the same group) and plus one (all relations with other groups).

with increasing E-I index values (Krackhardt and Stern 1988). Moreover, additional work revealed an association between the E-I index, increases in cooperation and reductions in conflict (Nelson 1989). The E-I model works under the critical assumption that the knowledge is in principle uncontested. However, in the case of contested knowledge or controversial innovation, too high a connectivity with the rest of the organization would lead to resistance and lock-out of the innovation.

The second model focuses on the diffusion of controversial innovation and examines the characteristics of network structure that facilitate its successful dissemination (Krackhardt 1997, 2001). An innovation is controversial if its superiority to existing practice is ambiguous and dependent on the perception of others (McGrath and Krackhardt 2003). On the basis of computer simulation Krackhardt develops the viscosity model of organizational change and observes two stable principles of the diffusion process (Krackhardt 1997): (i) the *principle of peripheral dominance* states that "it is more likely that a change will be adopted throughout the organization if the adopters occupy a cluster that is at the periphery and has relatively few bridges to the organization than if they occupy a position at the center of the organization's structure" (McGrath and Krackhardt 2003: 329). (ii) the principle of optimal viscosity states that the adoption of controversial innovation only works in a small window of optimal viscosity. Viscosity denotes the degree of migration or contact between groups/clusters of an organization. When viscosity is too high, the innovation is turned down because non-adopters outnumber adopters. Controversial innovation can only prevail under conditions of optimal viscosity, i.e. when external relations between clusters are moderate such that the innovation can diffuse slowly. McGrath and Krackhardt conclude "if the innovators are located on the periphery, with some limited contact and exposure to the rest of the organization, they can safely establish the change, demonstrate its effectiveness, and then spread the word to one neighboring subunit at a time (2003, 330).

In contrast to the E-I-model, the success of the diffusion process depends on loose interrelation and potentially low degrees of connectivity between the individuals or units of an organization. In consequence, controversial innovation is most likely to prevail if seeded in the periphery of a network. In the context of knowledge transfer within transnational corporations, this model would suggest to launch contested and ambiguous innovations or change initiatives in weakly connected units or locations of the corporate network. This model is based on computer simulation. Empirically, however, there has not been any attempt to challenge its validity in organizational knowledge processes (McGrath and Krackhardt 2003).

Both theories, the theory of (alleviated) inertia in the organizational periphery and the viscosity model of controversial change contribute to an understanding of the particular role of peripheral subsidiaries in transnational corporations. In line with the two approaches, one would expect peripheral subsidiaries to be places for the creation and adoption of controversial innovation and sources of their perennial and successful diffusion through the corporate network. The following sections use empirical observations from a case study in Argentina. The aim of the empirical analysis is to identify incidents of successful controversial innovation and to explore the particular enabling conditions for a peripheral subsidiary to create and transfer innovation.

4 An unacknowledged peripheral innovation: the CPU model

This research is based on mixed-method empirical fieldwork in one of the leading global chemical corporations: BASF. The research uses two sources of observations: qualitative interviews and a standardized network survey. Both kinds of observations were made during in-situ fieldwork stages in 2006 and 2007. The approach for qualitative interviews proved helpful to explore the conditions, trajectories and qualities of successful knowledge sharing and collective knowledge creation in the local market. In total, 29 interviews were carried out with the subsidiary president, division and unit managers, expatriate managers from Germany, and labora-

tory supervisors. Interviews took between one and one and a half hours, were digitally recorded and subsequently transcribed for qualitative content analysis. This section reconstructs the local creation of a controversial innovation – the cost-per-unit (CPU) automotive OEM coatings model – and its diffusion to the home country and to lateral parts of the global corporation.

The Argentinean subsidiary employs roughly 0.7% of the global workforce and accounts for no more than half a percent to global revenues. BASF began commercial operation in Argentina in the early 1950s and established its own production and administration facilities in 1972. In 1988, BASF took over the domestic firm *Lusal y Crisa* and started to produce coatings for the automotive industry in a plant located in the suburbs of Buenos Aires (Tortuguitas). Over the years, they achieved the position of a leading supplier of automotive OEM (Original Equipment Manufacturer) coatings. This business unit offers finish and refinish systems for vehicle bodies that protect the vehicle from corrosion (cathodic dip), gravel and chippings (primer), provide color (basecoat) and offer protection from environmental factors (topcoat).

In 1995, BASF Argentina pursued a breakthrough innovation in its automotive coatings business model. Until then, they were a mere supplier of chemicals and associated technical assistance to their customers. A team of chemists with long-term experience in the automotive sector that had been incorporated through the takeover of *Lusal y Crisa*, wanted to transform the business model from the supply of a commodity to the provision of a full service-package. The responsible manager of the automotive coatings business unit had joined *Lusal y Crisa* in 1978 and stayed with BASF after the takeover in 1988. He was involved in the whole process from the very beginning and offered witness to the commercial introduction of the new business proposition³. With their professional experience in coatings production and technical attendance to the automotive industry, this incorporated team recognized the opportunity to offer a more efficient service, to increase profits and to make car manufacturers more dependent on their product if they became an integral part of the car assembly process. Given their established supplier relation with Volkswagen, they suggested to take over and operate their paint finishing system onsite. Instead of assisting the workers in the painting of car bodies, they offered to perform the entire process with their own workers at the client production plant. This proposition offered immediate advantages to the automotive OEM. Often, the manufacturer cannot accurately assess the quality of the finish and is thus left with a reliability risk of quality⁴. In contrast, BASF offered a full service where the client no longer paid for the quantity of coatings (cost per liter) but for the quality-controlled finished car body at a cost per unit – the so invented *CPU-model*.

³ “Nosotros en el año ‘95 hicimos el primer Outsourcing, en Argentina, y fue el primero en el mundo de BASF, que fue pintar por carrocería, en vez de ser simplemente unos vendedores de pintura por litro, ofrecimos algo mas que era la ingeniería de procesos. Es decir, que normalmente para esta época y en muchos lugares, se hace una asistencia técnica. Nosotros tomamos posiciones dentro de lo que es las terminales automotrices, dentro de ellos mismos, cosa que fue tremendamente difícil, porque nosotros éramos un cuerpo extraño dentro de otra empresa. Y hasta que pasamos muchos años, y tuvimos que aprender muchísimo, a un punto de que la gente de las automotrices nos dejaban hacer mas de lo que habíamos comprometido hacer. Pero lejos de negarnos, tratábamos de hacerlo, porque sabíamos con eso que íbamos a lograr una dependencia de ellos muy grande. Ya que ellos también son grupos de poder muy grandes. Y que se manejan a nivel mundial muy fuerte con los proveedores. Y a veces muy arbitraria. Pero hemos entrado en eso y hoy tenemos la posibilidad de tener un mercado oficial, y de revertir el negocio a nivel económico quizás con más fuerza que en otro lugar. Porque? Porque tenemos mucha dependencia. Nunca abusar de esa dependencia, y jamás que ellos piensen que somos los únicos. Al contrario, tratamos de ser los mejores dentro de los proveedores que tienen, pero jamás demostrar que somos monopólicos. Porque primeramente no lo somos, y tratamos de demostrar que no es así. Es un poco difícil, pero es la política que siempre se implementó, es la que sigo y es la que consensúo con todo el equipo, que son unas 95 personas.” (automotive coatings manager 20/31).

⁴ “Fue algo que lo ofertamos a ellos en ese momento, con los conocimientos que nosotros teníamos. Porque una automotriz nunca supo cuanto le salía un vehículo pintado. Entonces nosotros le dijimos, que van a tener la seguridad de que van a cobrar por coche pintado, obviamente que con un control permanente de los consumos, con un movimiento de los consumos de acuerdo a lo que realmente tiene que ser, entonces le sacamos toda esa complejidad a la industria automotriz, y le resumimos en un precio de la venta por carrocería.” (automotive coatings manager 20/44).

Initially, BASF Argentina was offered to take over the complete paint finishing system. This proposal, however, implied substantial risks for BASF. First, the automotive industry is so competitive and automotive OEMs are so powerful that a supplier cannot afford much failure⁵. Therefore, this innovation would have to be realized without any throwbacks. Second, coatings are a non-trivial product where both, product technology and painting process require profound expertise and perfect match⁶. Paints are difficult to produce and to transfer to different places for specific client requirements. Using the original recipe with local ingredients may produce variations in the final result, e.g. color, viscosity, reflections etc⁷. Operating the paint finishing system, would therefore incur all production and quality liabilities to the outsourcing partner. Third, the outsourcing of a client's production unit to them and the subsequent operation would have required about 250 workers in a situation where the entire division only employed 120 people.

The risks of this offering were obvious but the model was implemented with a mixture of pragmatism and surreptitiousness because the head-quarter initially resisted the concept⁸. The coatings division manager remembers: 'It was crazy at the beginning because it was such a generic approach. Even the headquarter was initially startled, before they began to realize how interesting this business model actually was⁹. When they sent the business proposal to their head-quarter in Germany, it was clearly resisted¹⁰. The team in Argentina,

⁵ "Es un negocio de estar el día a día en la casa del cliente, y tenemos cosas en Argentina que son interesantes, nosotros vendemos por unidades pintadas, no vendemos pinturas, vendemos el coche pintado. Y es interesante, creo que lo que marca o tira para arriba en el tratar de igualar, es el compromiso que se genera en el equipo para la industria automotriz, porque si fallas una vez, pierdes el negocio. Con lo cual no se puede fallar" (coatings division manager 21/13).

⁶ "Tenemos que entender que en automotriz la pintura por sí sola no define nada, gana el que domina la pintura y el proceso. En definitiva en un auto lo que se ve, es la pintura aplicada. Entonces hay que saber de pinturas, de procesos y el match entre ambas cosas. Básicamente nuestra gente que está en las terminales tiene que dominar los procesos, saber algo de pintura también. Nosotros tenemos un laboratorio de simulación donde se aplica las condiciones de las terminales automotrices que hay que seguir, y seguir formando gente. Generalmente cuando desarrollamos un producto lo vamos llevando a un nivel tal, que lo podamos reproducir en un 80 u 85 % las condiciones en una Terminal, y ahí probarlo. O sea que llegamos a la línea del cliente con un 90% de probabilidad de tener éxito. Como si fuera un prototipo. Ya está prácticamente, hemos invertido mucho dinero en cada sistema, porque nadie tiene uno igual al otro. Distinto es la copa del Peugeot, del Volkswagen...hay que invertir." (coatings division manager 21/23-24).

⁷ "La pintura en general es raro que uno pueda traer una pintura, y que funcione sin trabajo adicional en la línea de un cliente. Entonces por lo general hay que hacer pequeños o mayores trabajos de adaptación. Desde lo más sencillo que es realizar la adaptación del color que pide el cliente, hasta cumplir con determinadas especificaciones que el producto original no cumple, y son más complicadas." (coating laboratory manager 24/18). Another unit manager illustrates the problems in more detail: "Cuando uno varía las materias primas, puede variar el producto final. Lo mismo sucede en Pharma, es muy común y en pinturas pasaba algo muy similar. Vos podés tener una receta, en base a unas materias primas que se hizo por ejemplo en Alemania; y por ahí acá es otro tipo de producto, no exactamente igual, pueden llamarse de distinta manera y tener especificaciones distintas, pero cuando uno termina de fabricarlo, las características son un poco diferentes. Son distintas materias, distintas fuentes. A veces es el color, a veces la viscosidad, o distintas características. El color es algo realmente difícil. Es un conjunto de pigmentos distintos. Y uno a veces se encontraba con eso, que la materia prima o los pigmentos, el efecto que se obtenía, eran distintos. Era muy interesante cuando uno ve dos rojos perlados, y con el efecto de la luz tal vez se reflejaban distintos. Entonces había que usar otro aluminio, con otra partícula. Tenía toda su historia." (unit manager pharma, 1/23).

⁸ "Argentinien hatte wohl Anfang der 90er Jahre, das war kurz nach der Übernahme von Lacke und Farben, waren die ersten, die Volkswagen angeboten haben, ihre Lackierstraßen zu betreiben. Das ist wohl damals auch noch, ich sage mal, eher verdeckt geschehen, weil natürlich die ganzen Probleme, die man hat, die waren schwer zu diskutieren. Da haben die einfach relativ unbeobachtet, pragmatisch das gemacht, was der Markt verlangt hat und inzwischen, das wird Ihnen der ein oder andere sicherlich auch in Ludwigshafen erzählt haben. Die Lackierung, ich glaube die Pulverlackierung bei der Mercedes A-Klasse, in der Nähe von Stuttgart, die da von der BASF gemacht wird, das ist immer so das Paradebeispiel dafür." (performance chemicals manager, German expatriate 12/67)

⁹ "Fue una locura al inicio, porque era mucho más amplio. Hasta la BASF se había asustado, y después empezó a ver que era muy interesante. Hoy en Alemania se utiliza el CPU [cost per unit] y en muchos lados está." (coatings division manager 21/35).

¹⁰ "En el año '95 íbamos a ser muchos más, porque realmente con los contactos que nosotros teníamos, sobre todo en Volkswagen, que fue mi primer cliente que atendí como account manager, en realidad nos daban muchísimo más, nos daban la planta completa. Y esto, en

however, went on to negotiate the conditions for a partnership with VW before a group of headquarter delegates came to Argentina to finally assess the proposal. Given the financial and operative risks the headquarter turned down large part of the initiative and denied the required resources. As a consequence, the subsidiary revised the concept and made a more hybrid service offering at a smaller scale of operation. Instead of running the entire system, they focused on the core process within the paint finishing system. In 1995, then, BASF Argentina began to operate the coating plant on the premises of the OEM: ‘the raw chassis came in through the front door and left the back door painted’¹¹.

The business model soon proved a straight success. The contract with VW extended from three years to the current year of study and today, BASF provides its automotive OEM coatings to most car manufacturer in Argentina. The subsidiary increased its local market share for automotive coatings from about 10 percent to approximately 75% in 2007¹². Despite the fierce economic crisis in 2001 and 2002, the CPU model succeeded and helped this business unit grow to 95 employees (14 percent of the workforce) in the national market. When asked if the successful innovation was communicated to other parts of the corporation, the unit manager said: ‘I believe so and when our presidents [*note: usually German expatriates*] went to Europe they talked about our model with pride’¹³.

Interestingly, a couple of years later, the CPU-model appeared in an innovative project in Rastatt, Germany¹⁴. Together with Mercedes-Benz, BASF developed a coating method and prepared it for industrial-scale production to reduce coating consumption by 20 percent. In addition to this technological innovation, BASF introduced the CPU-model and, in 1997, they began to operate the paint finishing system in the production plant of the Mercedes “A” series (BASF 1998: 16). It is this outstanding launch of a system partnership that serves as the point of reference for later developments: “Our concept of system partnership, which we initiated four years ago with DaimlerChrysler in Rastatt, Germany, is increasingly meeting with a positive response from other automotive firms. Since then, we have taken on increasing levels of process responsibility at Volkswagen, Audi, Ford and Renault” (BASF 2002: 32). In the years after its market launch in Rastatt, the system

Alemania, lo tomaron como un factor de riesgo, y no estaban de acuerdo en hacerlo. Pero bueno. Como estábamos a mitad de camino, y teníamos una resolución y un día nos dicen que no, no lo pudimos hacer. Hubiera sido un golpe magistral, con un gran riesgo. Porque sabemos que somos un riesgo muy grande para la compañía, porque tenemos el 100% de hace muchos años, de responsabilidad de todos los productos” (automotive coatings manager 20/39). The manager goes on: “Y dijeron que no, porque claro. Imagínate si nosotros le decimos que tenemos que tomar a 270 personas, cuando en total de todo el equipo éramos 120. Por eso, yo digo, esta era la idea, y estos eran los riesgos. Tenemos que comprender a la gente cuando nos hablan de riesgo. Teníamos que cerrar el trato un lunes, y el domingo vino gente de Alemania, y dijeron no, no tomamos esa gente. Entonces hicimos lo siguiente: reducimos todo, al corazón de la planta, donde se hace el mix de la pintura [...]. Entonces la cantidad de personas obviamente bajó de 270 a 20 o 30, no recuerdo bien. Hicimos un híbrido, el lunes fuimos a hablarle a la gente de VW y le dijimos, mirá, hay una contraoferta. Hoy no tenemos la posibilidad de tomar el cien por cien, pero podemos hacer esto. Entonces sobre esto se puso a la gente que iba a estar trabajando, se puso que responsabilidades íbamos a tener nosotros, que responsabilidades iban a tener la gente de VW. Y así nos pusimos de acuerdo” (automotive coatings manager 20/57-58).

¹¹ “En el campo de VW ya había una planta separada. Totalmente, era un módulo aparte. Y recibía la carrocería virgen por un lado, y salía pintada por el otro” (automotive coatings manager 20/46).

¹² „Si, acá tenemos hoy por hoy el 75%. Atendemos a todas las automotrices, menos una” (automotive coatings manager 20/16).

¹³ Question: *Se valoró de que fue una innovación argentina?* Answer: “Es de suponer que sí. Siempre nos han hablado. Hemos tenido presidentes acá que han ido a Europa y han hablado de nuestro modelo con mucho orgullo. Yo creo que sí” (automotive coatings manager 20/86).

¹⁴ “Eso se replicó en Rastatt, en Alemania. En el año 2000 [correct year: 1997] copiaron un poco lo que se había hecho acá en el año 1995” (automotive coatings manager 20/60).

partnership innovation started a global career and received numerous awards¹⁵. From year to year, the company highlighted its pretence and visibility of system partnership in the annual reports: “our objective is to be the ‘zero headaches’ solution provider” (BASF 2004: 27). And they promoted the specific characteristic of the system partnership which “is a cost-per-unit invoicing system whereby customers pay for each perfectly coated auto body, rather than for the amount of product they use” (BASF 2004: 27). In the years after 1995, annual reports indicate above average earnings in the automotive coatings business and by 2004, the company confirms a successful evolution over a period of a decade: “BASF is now the leading system supplier for automotive coatings. Twenty production plants operated by eight automotive manufacturers in Europe, the Americas and Japan work with BASF according to this principle, the latest example being VW’s facility in Puebla, Mexico” (BASF 2004: 27)

5 Structural advantage of the periphery – a network analysis

The case study of the CPU model illustrates that a peripheral position in an organization may be conducive to the probing of a controversial innovation because of the capacity to promote initiatives that are considered remote and therefore partially unobserved. This section analyzes the network of knowledge transfer as constituted by the interpersonal relations of knowledge exchange between the employees at BASF Argentina. Based on the conceptual discussion and the qualitative fieldwork above, this section focuses on two dimensions of connectivity to explore the structural conditions for peripheral innovativeness and the ability to diffuse this innovation: local inter-unit communication and global inter-subsidiary and headquarter knowledge transfer.

5.1 Inter-unit knowledge transfer within the subsidiary

Given the smaller size of the local organization, a peripheral subsidiary may enjoy advantages in establishing multiple inter-unit exchanges. Strong local interconnection would offer the opportunity to share even unrelated and previously separated expertise between units and to combine new knowledge for commercial practice. An electronic network survey was used to collect information on the interpersonal knowledge sharing between all employees in the regional subsidiary as well as the knowledge sharing relations between these employees and the international colleagues within the global corporation. 449 employees were identified as the study group¹⁶. These employees were asked explicitly:

‘Who of your colleagues has been an important source of knowledge and expertise and who has helped you solve work-related problems in the past?’

Overall, 224 employees took part in the questionnaire (response rate 50%). The survey data were used to construct a matrix of interpersonal knowledge relations which was then analyzed with social network analytical tools. As Table 1 displays, the 224 colleagues reported a total of 1,219 directed relations in the local context. This corresponds with a network density of 2.4% of all possible exchange relations in the network. On average, people acknowledged the receipt of problem-solving knowledge by five colleagues, ranging between zero and

¹⁵ For example: the Fournisseur Optima Award from Renault, the Volkswagen Group Award, the DaimlerChrysler Eurostar Supplier Award (BASF 2003: 32), among many other national awards.

¹⁶ The survey was carried out in September 2007. The 449 employees were selected because they had personalized corporate email accounts and were thus able to communicate with other colleagues in addition to face-to-face contact. The remaining 274 employees were excluded because they worked exclusively in plant operations or local auxiliary services (e.g. cleaning). Therefore, they could not develop communication within the company other than face-to-face.

43 knowledge sources in the extreme. With respect to farness, 2.4% of all pairs of employees are directly connected, two thirds are connected through two, three or four contacts and another 30% of all pairs of people can only be reached over a path length of 5 or more intermediary contacts.

Table 1: *Descriptive statistics of the knowledge network*

Network measures	Mean	S.D.	Max	Sum
Components (size)	dna	dna	219	5
OutDegree	5.442	6.441	43	1,219
InDegree	5.442	5.520	28	1,219
E-I inter-unit	.0350	.6170	1.000	dna
E-I global	-.6470	.4390	1.000	dna
Distance (path length)	3.857	1.413	11	142,338

dna = does not apply; S.D. = standard deviation; Max = maximum value; distance is only calculated for reachable pairs.

The argument to explore here is about the inter-unit connectivity within the peripheral subsidiary. The individual orientation of each employee towards other units rather than her own unit is expressed as the E-I index (*E-I inter-unit*) presented above¹⁷. Table 1 displays the mean individual *EIs* for inter-unit relations and demonstrates that knowledge exchanged is fully balanced between intra and inter-departmental relations ($EI = .035$). Overall, the E-I index at the network level was also positive ($EI = .094$). Hence, the boundaries of organizational units did not constrain the individual sourcing of problem-solving expertise. In fact, the knowledge network completely transcends unit and departmental boundaries and seems to largely cut across the organizational business and functional units. Co-membership to a business unit¹⁸ is only weakly correlated with interpersonal knowledge exchange. In a regression model, the organizational division of labor accounts for only 3 percent of overall variation in the distribution of knowledge exchange. Figure 1 provides an illustration of the multiple interconnections between employees of all organization units and mirrors the topological closeness between the different divisional and functional activities at the subsidiary. Interviews provided lively examples of the fruits of this inter-unit accessibility and exchange. In one example, a laboratory supervisor in the industry coatings unit reported a successful co-development between the coatings labs and the polyurethane labs to innovate industrial paints with particular adhesive performance. This cross-unit generation and transfer of knowledge were fruit of easy access and high visibility of the activities in the subsidiary¹⁹.

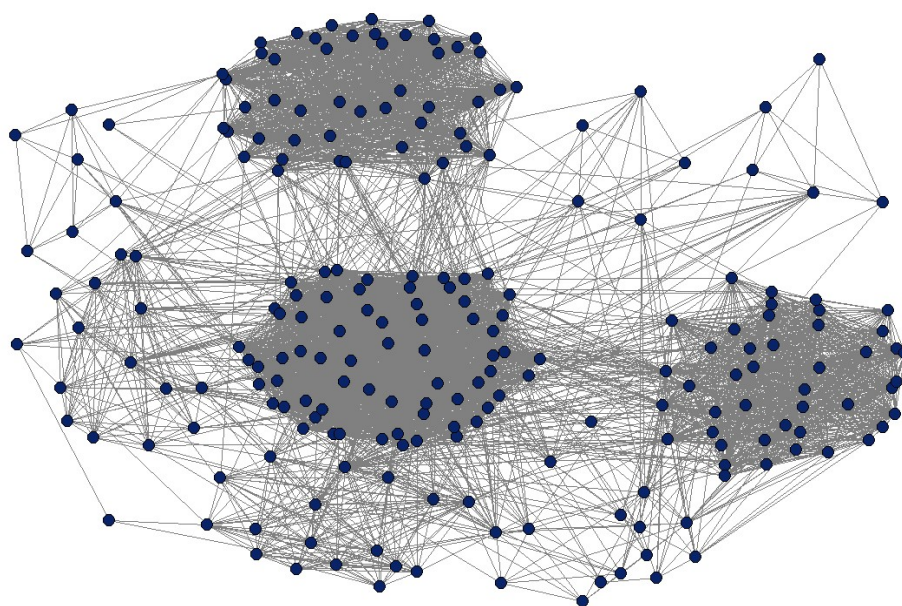
¹⁷ The E-I-Index requires undirected ties such that all one-directional knowledge relations are converted in reciprocal ties.

¹⁸ QAP correlation analysis, with Pearson correlation coefficient $r = 0.112$; $p < 0.001$; $N = 49,952$.

¹⁹ "hay muchas oportunidades potenciales de negocios con otros sectores de la compañía. En algunos negocios encontramos mucha actitud mental y en otros no. Esto no lo digo como una crítica hacia colegas, pero sí lo digo como algo que me preocupa, y mucho. Por ejemplo, la pintura que nosotros pintamos, el banker de chapa prepintada necesita tener una excelente adhesión con la espuma de poliuretanos. Con los colegas de poliuretanos, hemos hecho muchos trabajos en conjunto, que nos han ayudado a ofrecer este producto que ofrecimos a Siderar, cuya ventaja es la adhesión a poliuretanos. Hemos hecho muchas cosas en conjunto, a ellos se les abrieron las puertas a clientes en Chile, en fin. Ese es un ejemplo a seguir. Sabemos ahora que los colegas en Alemania, con la división ahora de espumas de poliuretanos, y tienen algunos proyectos con un potencial muy bueno para ir en conjunto al mercado. Ese es el ejemplo de los colegas con los que se puede trabajar bien. (...) Ahora estamos en una etapa de homologación con Siderar, si las cosas salen bien, teóricamente el producto sea homologado. Homologado quiere decir que vamos a recibir la aprobación de parte de nuestro cliente. Nuestro cliente todavía no nos aprobó, pero si se aprueba, se cotiza. En este caso que ventaja competitiva tiene? Bueno, tiene buena adherencia de espuma en poliuretanos que no la tienen nuestros competidores y digamos, nuestra idea, si bien no conocemos el precio exacto de nuestro competidor, sabe-

In conclusion, the subsidiary enjoyed a strong orientation to communicate and share knowledge across the organizational units. This finding nurtures the conjecture that a peripheral, small organizational unit may benefit from inter-unit closeness due to its smallness and the remoteness to other parts of related activities (Hansen and Lovas 2004).

Figure 1: *The knowledge network in BASF Argentina with people grouped by organizational units*



5.2 International knowledge sharing network

The second step in this analysis is to focus on international knowledge relations with colleagues from other parts of the world. From the perspective of the subsidiary, it will be important to be interconnected with the headquarter and other parts of the global organization to be able to receive and diffuse innovative knowledge. In addition to the local network survey, respondents were explicitly asked to identify their global knowledge relations in a second question:

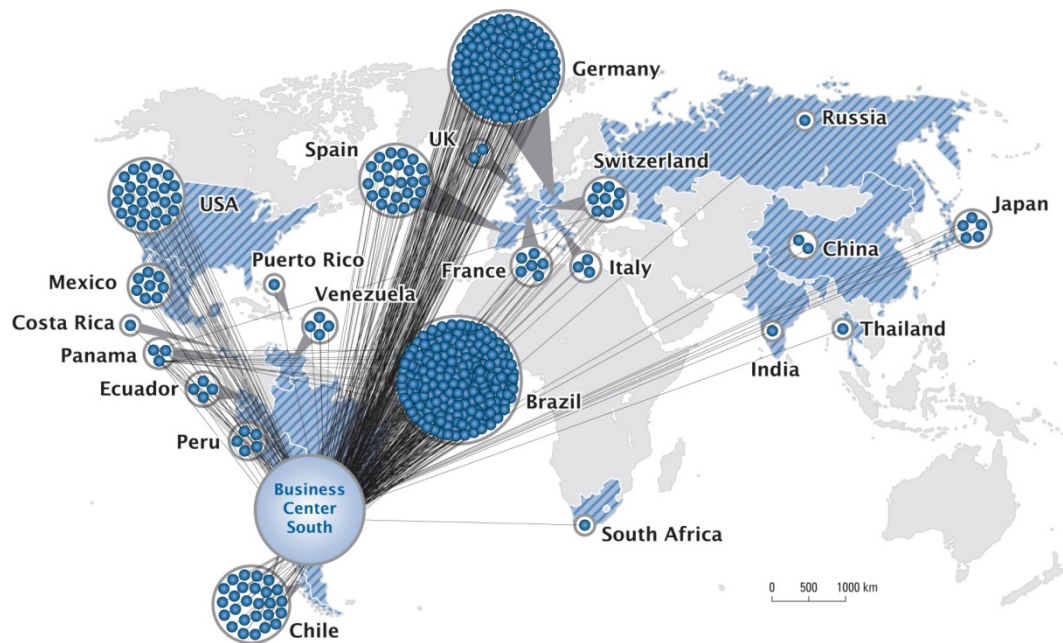
'Please, think of other colleagues within the global corporation who have been a source of new knowledge and expertise to improve your work. Please indicate their names and global location.'

In total, the 224 responding employees in Argentina generated a pool of contacts with another 467 international colleagues abroad. 60% of the employees reported at least one cross-border contact within the global organization that they found to be an important source of help to solve work-related problems. And nine percent of the local staff had even more knowledge sharing contacts abroad than in Argentina. Geographically, 29% of these contacts led to the headquarter in Germany and correspond with the hierarchical forward knowledge transfer discussed earlier (Figure 2).

mos cuanto se paga este producto en el mercado. Debería dejarnos un buen margen porque trabajamos con resinas de BASF, con lo cual fue diseñado para llegar a un objetivo de costo" (coatings laboratory manager 24/22).

The home country therefore represented an important and frequently consulted source of knowledge. Another 43% of contacts were maintained in Brazil. Especially at the level of the middle management many contacts went to Brazil because of the regional governance architecture of the corporation. Over the last years Brazil had become the leading market in Latin America for many industries and BASF graded Brazil up as the regional head of Latin America within the framework of an intermediate regional governance level. The Argentinean business thus reported directly to Brazil and the reporting lines to Germany lost significance. Therefore Brazil appears as another hierarchical transfer relation. In terms of more lateral international transfer relations, 5 percent of the contacts were found each in Chile, Spain and the USA. Nearly 90 percent of all contacts were directed to these five countries. Among the 467 contacts, 57 persons (12%) were named at least twice, 14 (3%) at least three times and one person in Brazil received 9 nominations by her Argentinean colleagues.

Figure 2: *International knowledge relations of BASF Argentina grouped by geographical location*



Interestingly, the individual orientations towards other units within the subsidiary and towards colleagues abroad are completely unrelated in statistical analysis. Those individuals who are oriented internationally are usually not very well connected in the inter-unit knowledge exchange. In other words, people rich in local diversity are not the people who are at the same time focused on global exchange. What then characterizes the sources of knowledge to be transferred within the subsidiary and who are these sources? A set of regression models illustrates some interesting associations in this respect (Table 2). The dependent variable is the prestige of an employee in the local knowledge network as measured by the number of people who nominated that person as an important knowledge source (*indegree*). Model 1 indicates a strong association between the prestige awarded to a person and the confirmation of that person to have made innovative contributions to the firm in the past. Obviously, knowledge is sought from those people who actually have expertise and promote new knowledge creation in the firm. Model 1 further suggests that prestige in knowledge increases with hierarchical status or management level. This association, however, disappears in further models (model 3) and can thus not be maintained. Prestige in knowledge and status within a managerial hierarchy are not necessarily related. Model 2 moves from attributes of people to the structure of their relations in the knowledge

network. Local prestige in the subsidiary declines with positive E-I values in global knowledge transfer. Moreover, a strong orientation toward local inter-unit knowledge transfer (*E-I inter-unit*) as well as the absolute number of international contacts (*global ties*) increase the prestige of an employee. As a result, people who maintain external linkages with colleagues abroad and at the same time engage in diverse inter-unit communication at the level of the subsidiary are most valuable as sources of problem-solving knowledge.

Table 2: Regression analysis for the estimation of employee prestige (*indegree*)

Variables	Model 1	Model 2	Model 3
Intercept	6.278 ^a	-1.015 ^a	-1.272 ^a
Innovative contribution	3.379 ^a		3.272 ^a
Hierarchical status	-0.631 ^b		-0.286
Global ties		0.813 ^a	0.766 ^a
E-I global		-5.909 ^a	-5.659 ^a
E-I inter-unit		0.779 ^c	0.260 ^c
<i>R</i> ² (<i>adjusted</i>)	.086	.185	.258
<i>F</i>	12.093	18.307	16.759
<i>p</i>	.000	.000	.000
<i>N</i>	177	177	177

p < .001; ^b *p* < .01; ^c *p* < .05

6 Discussion and Conclusion

The present study analyzed the creation and circulation of knowledge at the peripheral subsidiary of the chemical corporation BASF in Argentina. Based on interviews with managers at different levels and on a network survey of all local staff in Argentina, the findings support the notion that a well defined concept of periphery implies structural elements that favor the creation and diffusion of sometimes controversial innovation. Innovations are controversial when their superiority to existing practice is not evident and when the center of the organization resists their adoption. The reasons for managerial resistance to innovative ideas are manifold as empirical research suggests. Vandermerwe conducted explorative interviews to identify the major motives for organizational resistance to innovative proposals. These were: difficulties transmitting observable benefits, risks perceived as too high, lack of consensus on benefits, politics and psychological barriers, lack of clear access to power base, the 'Not-Invented-Here' syndrome, and difficulty justifying ROI and cost (Vandermerwe 1987). In the case of BASF, the innovation of the CPU-model was also resisted but managers benefited from being partially unobserved and therefore being able to continue venturing with the innovation. Especially when innovations are controversial, peripheral units that are less visible and harder to monitor are ideal locations for these innovations to emerge and prevail.

The results obtained from social network analysis showed that the peripheral subsidiary enjoyed remarkably dense intra-subsidiary knowledge exchange that facilitated the creation of cross-divisional and cross-functional innovative knowledge and enabled cross-selling opportunities. Despite the limited share of less than one percent in global revenues, the Argentinean subsidiary offers nearly all products and technologies to the local market. Given the small size of the operation and the large portfolio of products, specialization is limited and the functional and divisional units are rather small. The co-location of small units thus supports inter-unit communication and makes unrelated innovative ideas more likely. When peripheral units combine smallness with a high diversity of activities, they are more likely to experience inter-unit spillover and gener-

ate new knowledge. Moreover, the international exchange relations are consistent with the observation that a peripheral innovation diffused to the corporate core and other lateral units abroad. These singular case findings support earlier empirical work based on more stylized analysis. In a complex multi-method approach to the creation, diffusion and adoption of innovation between subsidiaries, Ghoshal and Bartlett found that the creation of new knowledge and innovation depended on strong intra-subsi-dary communication (Ghoshal and Bartlett 1988).

Since the peripheral subsidiary was not endowed with basic research and development but exposed to its local demand, managers developed a market orientation rather than a technology focus and sought new business offerings (such as the CPU model). A market orientation represents superior skills in understanding and satisfying customers (Day 1994). According to Day the principal features of market orientation are (i) a set of beliefs that puts the customer's interest first (Deshpandé *et al.* 1993), (ii) the capacity of the organization to generate, circulate, and use superior information about customers and competitors (Kohli and Jaworski 1990), and (iii) the coordinated application of inter-functional resources to the creation of superior customer value (Narver and Slater 1990). In marketing research, there is increasing empirical evidence that a market orientation is positively associated with superior business performance (Deshpandé, Farley, and Webster Jr 1993; Jaworski and Kohli 1993; Narver and Slater 1990). Small, peripheral markets offer a specific opportunity for global firms to explore and test new types of offerings and business models based on the same technological products. Once successfully applied, innovative marketing knowledge may be circulated and used in other parts of the organization. Interviews in this case study revealed a series of innovations in market offerings which qualify Argentina as a market-oriented learning site for the global corporation. In addition, managers highlighted further place-specific market opportunities in Argentina. They reported that in some highly competitive industries Argentinean client firms very less risk-averse than comparable clients in Europe and were more receptive to experimentation and trials. This risk-taking attitude promoted innovative thinking in the local subsidiary. Moreover, a second strategic opportunity for managers was to try to win emerging transnational firms from Argentina as new clients and to grow with them in the international markets.

The shift towards hybrid products which are mixes of tangible products and intangible services demonstrates that in highly competitive markets, the innovation of new marketing offerings becomes crucial: „consumers do not buy just a product; they buy a total bundle of values known as a market offering (Darling 2001: 209). Tangible goods are no longer the prime offering but become platforms for services which create customer value in new and better ways (Edvardson 2006). This shift forces firms into a stronger market orientation in order to detect value reserves in the particular customer needs. This incidence is an expression of a more general convergence of commodities and value-added services into hybrid market offerings (Stauss *et al.* 2008). This has also been proved in the context of headquarter-subsidiary relations. When transnational firms use subsidiary marketing knowledge they were found to increase overall performance (Holm and Sharma 2006).

This research may also have managerial implications in order to enhance the transfer of knowledge to the center of the corporation. Recent research suggests that the attention paid to subsidiaries by the headquarter decreases with geographical remoteness and limited significance of the local market (Bouquet and Birkinshaw 2008). However, subsidiaries may use voice strategies to actively seek attention. The basic mechanisms are initiative taking and profile building. Interestingly, very peripheral subsidiaries may gain equal or higher attention than more proximate subsidiaries by taking the same amount of initiatives or by having established the same level profile as more proximate and centric subsidiaries (Bouquet and Birkinshaw 2008). The competitive advantage of MNEs rests on their ability to use a reverse flow of resources and capabilities from foreign subsidiaries to the head-office (Ghoshal 1987). Lateral relations between subsidiaries will be increasingly important in the future when headquarter decentralize responsibility and support semi-autonomous organizational units (Hedlund 1994).

References

- Allen, T. (1977) *Managing the flow of technology: Technology transfer and the dissemination of technological information within the research and development organization*. Cambridge, MA: MIT Press.
- 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: 147-161.
- Ambos, T. C., Ambos, B. (2009) The impact of distance on knowledge transfer effectiveness in multinational corporations. *Journal of International Management* 15: 1-14.
- Ambos, T. C., Ambos, B., Schlegelmilch, B. B. (2006) Learning from foreign subsidiaries: An empirical investigation of headquarters' benefits from reverse knowledge transfers. *International Business Review* 15: 294-312.
- Bas, C. L., Sierra, C. (2002) Location versus home country advantages' in R&D activities: Some further results on multinationals' locational strategies. *Research Policy* 31: 589-609.
- BASF (1998) *Annual Report 1997* Ludwigshafen: BASF AG.
- (2002) *Annual Report 2001* Ludwigshafen: BASF AG.
- (2003) *Annual Report 2002* Ludwigshafen: BASF AG.
- (2004) *Corporate Report 2003* Ludwigshafen: BASF AG.
- Birkinshaw, J., Ridderstråle, J. (1999) Fighting the corporate immune system: A process study of subsidiary initiatives in multinational corporations. *International Business Review* 8: 149-180.
- Borgatti, S. P., Cross, R. (2003) A relational view of information seeking and learning in social networks. *Management Science* 49: 432-445.
- Borgatti, S. P., Everett, M. G. (1999) Models of core/periphery structures. *Social Networks* 21: 375-395.
- Bornschiefer, V. (1980) Multinational corporations and economic growth: A cross-national test of the decapitalization thesis. *Journal of Development Economics* 7: 191-210.
- Bouquet, C., Birkinshaw, J. (2008) Weight versus voice: How foreign subsidiaries gain attention from their corporate headquarters. *Academy of Management Journal* 51: 577-601.
- Burt, R. S. (2004) Structural holes and good ideas. *American Journal of Sociology* 110: 349-399.
- Cantwell, J., Santangelo, G. D. (2002) The new geography of corporate research in information and communications technology (ICT). *Journal of Evolutionary Economics* 12: 163-197.
- Chase-Dunn, C. (1975) The effects of international economic dependence on development and inequality: A cross-national study. *American Sociological Review* 40: 720-738.
- Christley, R. M., Pinchbeck, G. L., Bowers, R. G., Clancy, D., French, N. P., Bennett, R., Turner, J. (2005) Infection in social networks: Using network analysis to identify high-risk individuals. *American Journal of Epidemiology* 162: 1024-1031.

- Coff, R. W., Coff, D. C., Eastvold, R. (2006) The knowledge leveraging paradox: How to achieve scale without making knowledge imitable. *Academy of Management Review* 31: 452-465.
- Darling, J. R. (2001) Successful competitive positioning: The key for entry into the European consumer market. *European Business Review* 13: 209-220.
- Day, G. S. (1994) The capabilities of market-driven organizations. *Journal of Marketing* 58: 37.
- Deshpandé, R., Farley, J. U., Webster Jr, F. E. (1993) Corporate culture customer orientation, and innovativeness in Japanese firms: A quadrad analysis. *Journal of Marketing* 57: 23-37.
- Dougherty, D., Heller, T. (1994) The illegitimacy of successful product innovation in established firms. *Organization Science* 5: 200-218.
- Edvardson, B. (2006) Development of service research in Europe against the background of global economic change: experiences, challenges and trends. In D. Streich, D. Wahl (eds) *Moderne Dienstleistungen. Impulse für Innovation, Wachstum und Beschäftigung*. Frankfurt, New York: Campus. 23-26.
- Evans, P. B. (1981) Recent research on multinational corporations. *Annual Review of Sociology* 7: 199-223.
- Galtung, J. (1971) A structural theory of imperialism. *Journal of Peace Research* 8: 81-117.
- Ghoshal, S. (1987) Global strategy: An organizing framework. *Strategic Management Journal* 8: 425-440.
- Ghoshal, S., Bartlett, C. A. (1988) Creation, adoption, and diffusion of innovations by subsidiaries of multinational corporations. *Journal of International Business Studies* 19: 365-388.
- Gidengil, E. L. (1978) Centres and peripheries: An empirical test of Galtung's theory of imperialism. *Journal of Peace Research* 15: 51-66.
- Grabher, G., Ibert, O., Flohr, S. (2008) The neglected king: The customer in the new knowledge ecology of innovation. *Economic Geography* 84: 253-280.
- Grant, R. M. (1996) Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17: 109-122.
- Gupta, A. K., Govindarajan, V. (2000) Knowledge flows within multinational corporations. *Strategic Management Journal* 21: 473-496.
- Hannan, M. T., Freeman, J. (1984) Structural inertia and organizational change. *American Sociological Review* 49: 165-182.
- (1993) *Organizational Ecology*. Cambridge, MA: Harvard University Press.
- Hansen, M. T., Lovas, B. (2004) How do multinational companies leverage technological competencies? Moving from single to interdependent explanations. *Strategic Management Journal* 25: 801-821.
- Haveman, H. A. (1992) Between a rock and a hard place: organizational change and performance under conditions of fundamental environmental transformation. *Administrative Science Quarterly* 37: 48-75.
- Hedlund, G. (1994) A model of knowledge management and the N-form corporation. *Strategic Management Journal* 15: 73-90.

- Holm, U., Sharma, D. D. (2006) Subsidiary marketing knowledge and strategic development of the multinational corporation. *Journal of International Management* 12: 47-66.
- Inkpen, A. C., Tsang, E. W. K. (2005) Social capital, networks, and knowledge transfer. *Academy of Management Review* 30: 146-165.
- Jaworski, B. J., Kohli, A. K. (1993) Market orientation: Antecedents and consequences. *Journal of Marketing* 57: 53.
- Krackhardt, D. (1994) Constraints on the interactive organization as an ideal type. In C. Heckscher, A. Donnellan (eds) *The Post-Bureaucratic Organization*. Beverly Hills, CA: Sage. 211-222.
- (1997) Organizational viscosity and diffusion of controversial innovations. *Journal of Mathematical Sociology* 22: 177-199.
- (2001) Viscosity models and the diffusion of controversial innovations. In A. Lomi, E. R. Larsen (eds) *Dynamics of Organizations: Computational Modeling and Organizational Theory*. Cambridge, MA: MIT Press. 243-268.
- Krackhardt, D., Stern, R. N. (1988) Informal networks and organizational crises: An experimental simulation. *Social Psychology Quarterly* 51: 123-140.
- Krugman, P. (1991) *Geography and Trade*. Leuven, Belgium; Cambridge, MA: Leuven University Press; MIT Press.
- Krumme, G. (1969) Toward a geography of enterprise. *Economic Geography* 45: 30-40.
- Kuemmerle, W. (1997) Building effective R&D capabilities abroad. *Harvard Business Review* 97: 61-70.
- (1999) Foreign direct investment in industrial research in the pharmaceutical and electronics industries. Results from a survey of multinational firms. *Research Policy* 28: 179-193.
- Langholm, S. (1971) On the concepts of center and periphery. *Journal of Peace Research* 8: 273-278.
- Leamer, E. (2007) A flat world, a level playing field, a small world after all, or none of the above? A review of Thomas L. Friedman's *The World is Flat*. *Journal of Economic Literature* 45: 83-126.
- Leamer, E., Storper, M. (2001) The economic geography of the internet age. *Journal of International Business Studies* 32: 641-665.
- Mabogunje, A. L. (1980) The dynamics of centre-periphery relations: The need for a new geography of resource development. *Transactions of the Institute of British Geographers* 5: 277-296.
- Maskell, P. (2001) The firm in economic geography. *Economic Geography* 77: 329-344.
- McGrath, C., Krackhardt, D. (2003) Network conditions for organizational change. *Journal of Applied Behavioral Science* 39: 324-336.
- McNee, R. B. (1958) Functional geography of the firm, with an illustrative case study from the Petroleum industry. *Economic Geography* 34: 321-337.

- Moran, T. H. (1978) Multinational corporations and dependency: A dialogue for dependentistas and non-dependentistas. *International Organization* 32: 79-100.
- Mytelka, L. K. (1978) Licensing and technology dependence in the Andean group. *World Development* 6: 447-459.
- Narver, J. C., Slater, S. F. (1990) The effect of a market orientation on business profitability. *Journal of Marketing* 54: 20-35.
- Nelson, R. E. (1989) The strength of strong ties: Social networks and intergroup conflict in organizations. *The Academy of Management Journal* 32: 377-401.
- Owen-Smith, J., Powell, W. W. (2004) Knowledge networks as channels and conduits: The effects of spillovers in the Boston biotechnology community. *Organization Science* 15: 5-21.
- Palma, G. (1978) Dependency: A formal theory of underdevelopment or a methodology for the analysis of concrete situations of underdevelopment? *World Development* 6: 881-924.
- Patel, P., Vega, M. (1999) Patterns of internationalisation of corporate technology: Location versus home country advantages. *Research Policy* 28: 145-155.
- Porter, M. E. (1985) *Competitive Advantage. Creating and Sustaining Superior Performance*. New York: Free Press.
- Prebisch, R. (1959) Commercial policy in the underdeveloped countries. *The American Economic Review* 49: 251-273.
- (1986) El desarrollo economico de la America Latina y algunos de sus principales problemas. *Desarrollo Económico* 26: 479-502.
- Richardson, H. W. (1978) *Regional Economics*. Urbana, Chicago, London: University of Illinois Press.
- Rogers, E. M. (1995) *Diffusion of Innovations* (4th ed.). New York: Free Press.
- Stauss, B., Engelmann, K., Kremer, A., Luhn, A. (eds) (2008) *Services Science. Fundamentals, Challenges and Future Developments*. Berlin, Heidelberg: Springer.
- Szulanski, G. (2003) *Sticky Knowledge. Barriers to Knowing in the Firm*. London: Sage.
- Thomke, S., Kuemmerle, W. (2002) Asset accumulation, interdependence and technological change: Evidence from pharmaceutical drug discovery. *Strategic Management Journal* 23: 619-635.
- Tsai, W. (2001) Knowledge transfer in intra-organizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal* 44: 996-1004.
- Ullman, E. L. (1953) Human geography and area research. *Annals of the Association of American Geographers* 43: 54-66.
- van Wijk, R., Jansen, J. J. P., Lyles, M. A. (2008) Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies* 45: 830-853.

Vandermerwe, S. (1987) Diffusing new ideas in-house. *Journal of Product Innovation Management* 4: 256-264.

Yanow, D. (2004) Translating local knowledge at organizational peripheries. *British Journal of Management* 15: 9-S25.