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TRANSFERÊNCIA REVERSA DE CONHECIMENTO: UM COMPARATIVO ENTRE AS SUBSIDIÁRIAS DE MERCADOS EMERGENTES E SUBSIDIÁRIAS DE MERCADOS DESENVOLVIDOS

REVERSE KNOWLEDGE TRANSFER: A COMPARISON BETWEEN SUBSIDIARIES OF EMERGING MARKETS AND SUBSIDIARIES OF DEVELOPED MARKETS

TRANSFERENCIA INVERSA DE CONOCIMIENTO: UNA COMPARACIÓN ENTRE LAS FILIALES DE MERCADOS Y SUBSIDIARIAS EMERGENTES EN LOS MERCADOS DESARROLLADOS

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RESUMO

O objetivo do artigo consiste em contrastar o impacto da rede interna e externa no processo de transferência reversa de conhecimento em subsidiárias estrangeiras no Brasil e de subsidiárias brasileiras no exterior. Em relação as subsidiária estrangeiras foram obtidas cento e setenta e duas empresas, quanto à base de dados referente às subsidiarias de empresas brasileiras, a amostra obtida foi de setenta e oito subsidiárias brasileiras no exterior. Os resultados mostram o impacto da rede para ambos os tipos de multinacionais, porém o mesmo não acontece com a integração.

Palavras-chave: Inovação Reversa; Transferência de Conhecimento Reversa; Subsidiárias Estrangeiras; Redes; Multinacionais Emergentes; Mercados Emergentes.

REVERSE KNOWLEDGE TRANSFER: A COMPARISON BETWEEN SUBSIDIARIES OF EMERGING MARKETS AND SUBSIDIARIES OF DEVELOPED MARKETS

ABSTRACT

This paper aims at contrasting the impact of the internal and external network on the reverse knowledge transfer process in foreign subsidiaries in Brazil and Brazilian subsidiaries abroad. With regard to foreign subsidiaries, one hundred seventy-two companies were obtained, and as to the database pertinent to subsidiaries of Brazilian firms, the sample acquired consisted of seventy-eight Brazilian subsidiaries abroad. The results show the impact of the network for both types of multinationals, however, the same does not occur with integration.

Keywords: Reverse Innovation; Reverse Knowledge Transfer; Foreign Subsidiaries; Network; Emerging Multinational; Emerging Markets.

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RESUMEN

El objetivo de este trabajo es contrastar el impacto de la red interna y externa en la transferencia de conocimiento inverso de las filiales extranjeras en Brasil y filiales brasileñas en el exterior de proceso. En cuanto a la filial extranjera se obtuvieron ciento setenta y dos empresas, ya que la base de datos relativa a las filiales de las empresas brasileñas, la muestra incluyó a setenta y ocho filiales brasileñas en el exterior. Los resultados muestran el impacto de la red para ambos tipos de empresas multinacionales, pero el mismo no es una verdadera integración.

Palabras-clave: Innovación Inversa; Transferencia de Conocimientos Inversa; Subsidiarias Extranjeras; Networks; Las Multinacionales Emergentes; Los Mercados Emergentes.

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1 INTRODUCTION

One of the main advantages of establishing multinational corporations comes from the ability to acquire and use knowledge in different countries with more efficiency and effectiveness than through market mechanisms (Almeida, Song, & Grant, 2002; Gupta & Govindarajan, 2000; Kogut & Zander, 1993; Michailova & Mustaffa, 2012; Mudambi, 2002). One of the most significant contributions from subsidiaries to corporations to which they are part relates to the transfer and dissemination of innovative activities, either to the parent company or to other subsidiaries (Birkinshaw, Hood, & Jonsson, 1998; João, 2009). This knowledge transfer process, from subsidiary to parent company, is called reverse knowledge transfer (Ambos, Ambos, & Schlegelmilch, 2006).

The growing number of studies on companies from emerging countries (Peng, Sun, Pinkham, & Chen, 2009) bring to the fore the increasing importance of firms originating in such countries, competing and even becoming a threat to already established traditional multinational companies (Govindarajan & Ramamurti, 2011b; Ramamurti, 2008). In order to remain competitive before this phenomenon, traditional multinational companies have to resort to innovations generated in emerging markets, evaluating products developed in such markets and being willing to rethink the assumptions underlying the units located in developed markets (Govindarajan, 2012). The innovation process does not consist only of innovative activities as the introduction of new products and technologies, but also of other activities that promote knowledge transfer such as joint ventures with foreign partners, new licensing agreements, opening of a new plant or outsourcing of a productive activity (Ayyagari, Demirguç-Kunt, & Maksimovic, 2011).

When traditional multinational companies export knowledge, as well as innovations from emerging countries to developed markets, new possibilities may suddenly appear. The limits that had been imposed by traditional operations in developed markets become outdated and the company gets the chance to rethink its products and enter new markets in search of growth (Govindarajan, 2012). In order to commit and take more risks in markets where the environment is rather different (Peng et al., 2009; Ramamurti, 2008), companies tend to resort to actions that increase their engagement with the external network, such as local partnerships (Xu & Shenkar, 2002).

On the other hand, emerging countries lack local qualification to produce high-tech knowledge and, therefore, resort to different mechanisms to transfer knowledge from foreign countries (Iammarino, Padilla-Pérez, & Tunzelmann, 2008); therefore, the strategic model of said

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companies is based on the search for overseas resources (Bartlett & Ghoshal, 2000; Guillén & E., 2009; Mathews, 2006). Some studies with Brazilian multinationals have been showing this reasoning and the resulting reverse knowledge transfer. With regard to factors of the internal environment, Borini, Oliveira Júnior, Silveira, and Concer (2012) show that the strategic orientation towards innovation and entrepreneurship, coupled with the strategic alignment of the parent company and subsidiaries, consist of organizational factors that are preponderant for reverse knowledge transfer in Brazilian multinationals. Furthermore, Borini and Fleury (2011) add by showing that, within Brazilian multinationals, the reverse knowledge transfer process depends on internal factors of the organization, such as the integration between parent company and subsidiaries and the development of initiatives, and also on the inclusion of subsidiaries into the external network.

Due to the different reasons regarding reverse knowledge transfer on the part of traditional and emerging multinationals, this paper aims at contrasting the impact of the internal and external networks on the reverse knowledge transfer process in foreign subsidiaries in Brazil and of Brazilian subsidiaries abroad.

The paper is organized into the following sections: literature review; development of assumptions; methodology; results and discussion.

2 THEORETICAL FRAMEWORK

2.1 REVERSE KNOWLEDGE TRANSFER

Knowledge transfer occurs when the company recreates complex routine processes with the necessary adjustments and keeps them running (Yang, Mudambi, & Meyer, 2008). Ambos et al. (2006) assume that firms are a network of different responsibilities and roles where access to internal and external knowledge networks allows for the continuous creation and renewal of their competitive edge. Earlier research on the topic emphasized that the competitive edge of multinational companies during expansion was determined by the countries where the parent company was installed. The transfer of knowledge in traditional multinationals targets the creation of competitive edge for subsidiaries towards competition, which may later become a competitive edge for the corporation as a whole (Rocha & Borini, 2011). However, this strategy is no longer sufficient to generate competitive edge, unless the parent company is the only one capable of developing new technologies and skills (Ambos et al., 2006).

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When analyzing the chain by subsidiary and not only by parent company, it is possible to add more strategic value to multinationals (Paterson & Brock, 2002), which can no longer rely solely on their headquarters, especially in terms of knowledge and tangible resources (Chini, 2004). However, knowledge is difficult to transfer within the organization, especially when it is tacit. Factors such as characteristics of the knowledge to be transferred, origin and characteristics of target units, organizational context and environmental factors of both the subsidiary and the parent company may affect the transfer process. Thus, the interaction of transfer participants and the potential barriers are primordial to an effective transfer (Yang et al., 2008).

By changing the hierarchical view to a corporate view through networks, an increasing number of studies have changed focus from the parent company to the subsidiary as a central point of analysis (Andersson, Forsgren, & Holm, 2002; Michailova & Mustaffa, 2012; Rugman, Verbeke, & Yuan, 2011). Subsidiaries have their own knowledge collection sources that, in order to generate competitive edge, must be widespread in the corporation (Oliveira Jr, Boehe, & Borini, 2009). The knowledge derived from subsidiaries may assist in coordinating and formulating the global strategy, improving network processes and even in product development. The transfer of knowledge from the subsidiary to the parent company is called reverse transfer and deserves attention because it is an important source of competitive edge for multinationals, whether from developed countries (Ambos et al., 2006; Andersson et al., 2002; Kohlbacher & Krähe, 2007; Oliveira Jr, Boehe, et al., 2009), or developing countries like Brazil (Borini et al., 2012; Iammarino et al., 2008). Reverse knowledge transfer is more complex than conventional knowledge transfer, since subsidiaries are interested in transferring knowledge to the parent company, after all it can ultimately bring greater strategic relevance to them within the network; however, the parent company may only be interested in transfers it deems beneficial. Therefore, in some situations, the parent company may not recognize the knowledge benefit owned by the subsidiary and thus not take the necessary measures for its applicability, which indicates that "the reverse transfer process is a persuasion process" (Yang et al., 2008), since subsidiaries need to convince the parent company of its relevance (Yang et al., 2008).

The knowledge flow researches in subsidiaries have increased considerably in recent years and, as with any field of literature under development, which has not yet reached maturity, multiple definitions and measures are exposed to ambiguous or conflicting conclusions and results, resulting in a lack of consensus (Michailova & Mustaffa, 2012). Michailova and Mustaffa (2012) conducted a study on the knowledge flow literature in subsidiaries. Articles published on respected management journals between 1996 and 2009 have been analyzed and the most discussed topics were: the characteristics of subsidiaries, the success and effectiveness of the transfer process and

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quality, interaction and relationship with the networks. In the case of subsidiaries that participate actively in the knowledge generation process and transfer this knowledge to the rest of the corporation, most projects focuses only on checking for potential transfers of knowledge from the subsidiary to parent company and to what extent it occurs. According to the authors, this trend is due to the traditional view that treats subsidiaries as knowledge recipients.

Through a literature review, McGuinness, Demirbag, and Bandara (2013) proposed a reverse knowledge transfer model based on four major constructs: (1) potential to create knowledge, (2) relevance of knowledge created, (3) ability to perform reverse transfer of new knowledge (4) motivation for reverse transfer of new knowledge.

2.1.1 REVERSE TRANSFER IN MNC OF DEVELOPED COUNTRIES

For decades, one of the key parts of the strategy of multinationals has been the flow of innovation from developed markets to developing markets (Govindarajan, 2012). In order to verify the reverse knowledge transfer process in traditional foreign multinationals through immersion in the local external networks, Andersson et al. (2002) infer that the technical immersion has positive impact both on the performance expected from the subsidiary and on its role in the multinational's production process and product development. Indirectly, through technical immersion, the immersion in the corporate network also influences the subsidiary's market performance, as well as the development of products and business affairs of other units of the MNC.

In order to examine the preceding factors that influence organizational knowledge sharing among subsidiaries in emerging markets and their pairs in other countries in a sample of Chinese subsidiaries of traditional manufacturing multinationals, Zhao and Luo (2005) find that intra-subsidiary knowledge sharing depends on the strategic interdependence of the subsidiary as well as the technological link between pairs of subsidiaries, such as intranet infrastructure, system of incentives and encapsulation of knowledge, which is understood as the routine processes of coding, storing and converting knowledge into a recoverable and sharable form. In the same vein, Noorderhaven and Harzing (2009) conclude that the integration between the managing units from different units within a company pose a considerable effect on intra-organizational knowledge flows, emphasizing the importance of this mechanism.

Complementing the discussion, Amatucci and Bernardes (2007) found that the qualification of subsidiaries of traditional multinational companies located in emerging countries relates to the evolution of domestic competitiveness stages, since the aspects that differentiate a subsidiary from

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another consist of domestic conditions in which they operate, such as workforce training, volume of internal market and tax policy.

2.1.2 REVERSE TRANSFER IN A DEVELOPING COUNTRY MNC

Traditionally, emerging countries lack local qualification for the creation of new knowledge and, thus, resort to different mechanisms to transfer knowledge from foreign countries (Iammarino et al., 2008), which are usually developed countries, because they have advanced technology and industrialization processes (Figueiredo, 2009; Kim, 1997). Specifically with regard to emerging multinationals, reverse knowledge transfer is an important aspect, given the fact that the strategic model of said companies is based on the search for resources overseas (Bartlett & Ghoshal, 2000; Guillén & E., 2009; Mathews, 2006). Unlike companies located in developed countries, undergoing a mature industrialization stage, in most companies of emerging countries, the innovative technological capabilities still need development and, therefore, during the early stages of industrialization, they transfer/import consolidated foreign technology from countries with an advanced level of industrialization (Figueiredo, 2009).

If knowledge is a factor that can generate competitive edge for traditional multinationals, it seems even more important for emerging multinationals, which internationalize in search of new resources and expertise (Mathews, 2006). The transfer of knowledge in emerging multinationals is vital due to the undeveloped internationalization process (Doz, Santos, & Williamson, 2001; Mathews, 2006).

Some studies with Brazilian multinationals have been showing this search for overseas resources and the resulting reverse knowledge transfer. With regard to factors of the internal environment, Borini et al. (2012) show that the strategic orientation towards innovation and entrepreneurship, coupled with the strategic alignment of the parent company and subsidiaries, consist of organizational factors that are preponderant for reverse knowledge transfer in Brazilian multinationals. Through a study with a Brazilian multinational, Ribeiro and Oliveira Jr (2008) found that expatriation and technical visits were key tools in the process of conventional and reverse transfer that took place in companies during a subsidiary acquisition process held overseas.

Furthermore, Borini and Fleury (2011) add that, in Brazilian multinationals, reverse knowledge transfer depends on the organization's internal factors, such as the integration between parent company and subsidiaries and the development of initiatives, but also depends on the inclusion of subsidiaries into the external network. However, Oliveira Jr and Borini (2012) show

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that reverse knowledge transfer is not common to all subsidiaries, being especially common to those that share the internal factors mentioned above and when strongly embedded into the business networks abroad.

2.2 BUSINESS NETWORKS

The literature on social networks is more recent than the literature developed on strategic alliances. And, in its development process, the network theory was rather influenced by the theories on strategic alliances. Gulati (1998) highlights the variability of potential configurations for the term "networks", which may occur as the result of a wide range of motives and goals and happen across vertical or horizontal borders. This gives rise to many similarities and analogies between such theories. According to Balestrin and Verschoore (2008), the term network is widely used in various fields of knowledge (computer networks, social networks, business networks, etc..) so there is an overexposure of the concept and ambiguity in its understanding. Based on the exchange and diversity among terms that discuss cooperative arrangements, it is possible to understand that a set of alliances will form a network. Thus, it is important to list some characteristics that make up the theory of strategic alliances and that also apply to the theory of business networks; among these common characteristics are: the importance of the learning channel, access to new technologies and internalization of new skills made possible by collaborative alliance (Barney & Hesterly, 2008; Giroud & Scott-Kennel, 2009; Inkpen, 2008; Kogut & Zander, 1993).

Collaborative networks are not restricted to a dyadic relationship in which only two companies are involved, but they are driven by the benefit received from the access to their partner's partners (e.g. automotive industry and its suppliers, Embraer and its domestic and foreign suppliers). And, as strategic alliances are mainly characterized by relationships that are not as formalized. Two identically structured networks are not likely to exist, so the common point between the alliances and the networks lies in the search for certain ends that would hardly be achieved solely or individually. The following are included in the network context: consortia, multi-alliances, supplier networks and industrial clusters (Balestrin & Verschoore, 2008). Thus, Gulati (1998) recognizes that alliances and networks are versatile and evolutional structures of cooperation between companies that must be viewed in an integrated manner.

According to Gupta and Govindarajan (1991), a MNC can be understood as a network of capital, products and knowledge transactions between units, where knowledge is defined as "any experience (e.g. skills and abilities) or external data from markets that have strategic value" (Gupta

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& Govindarajan, 1991; Kohlbacher & Krähe, 2007; Rabbiosi, 2011). Andersson et al. (2002) posit that the strategic importance of subsidiaries is directly related to the network in which it is inserted, since it provides access to new ideas and opportunities.

A subsidiary that relates strongly with other network members may derive competitive advantages based on two ways set out by Andersson et al. (2002): - First, it can be assumed that the subsidiary, having access to network resources, will cause impacts to the competitiveness within its market. Second, should it be possible to transfer these skills to other units of the multinational's internal network, external network access ends up representing a source of qualification for the entire multinational.

In the process of internationalization, emerging multinationals differ from traditional multinationals through process innovations (Mathews, 2006), since they are located in environments not conducive to technological innovation, which leads them to import such technology from developed countries (Figueiredo, 2005; Kim, 1997). As latecomers, such companies need to find innovative ways to competitively tread into international markets and, according to Mathews (2006), a possibility is the use of international connections with consolidated companies, such as offering service agreements, licensing new technologies, and forming joint ventures and strategic alliances. These tools can be understood as integration with the external network (Doz et al., 2001).

In contrast, multinationals of traditional countries are facing problems in emerging markets, since products exported to these markets, generally slightly modified versions of global products produced for developed markets, no longer meet local requirements(Eyring, Johnson, & Nair, 2011; Govindarajan, 2012; Govindarajan & Trimble, 2012b; Markides, 2012). Therefore, said companies have begun to use the innovations from emerging markets in other consolidated emerging markets or even in developed markets, since, in certain situations, these products or processes offer a new, unexpected value, which is sometimes forgotten. Examples of innovations developed in emerging markets and later reused in developed markets include Wal-Mart's "small super markets", which were very well suited to the limited space and soaring rents of large U.S. cities, and GE's portable ultrasound scanner developed in China, but widely accepted in developed markets (Govindarajan & Trimble, 2012b). In order to accomplish reverse innovation, it is necessary for subsidiaries of multinational companies located in traditional emerging countries to use local resources, have a favorable image through local businesses and establish connections with key local stakeholders, such as government and financial institutions (Govindarajan & Trimble, 2012b).

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Therefore, given the importance of business networks as a source of innovation skills, the following assumption is proposed:

> H1a: Inclusions into networks of subsidiaries from emerging markets is positively associated with reverse knowledge transfer.
> H1b: Inclusions into networks of subsidiaries from developed markets is positively associated with reverse knowledge transfer.

2.3 INTEGRATION

Integration is related to the values shared between the units, which allows the headquarters to understand the subsidiaries and vice versa. Two organizational elements are essential for integration: communication and socialization (Nohria & Ghoshal, 1997).

The formal organizational structure reflected in the relationship of interdependence of the subsidiaries with the headquarters and other subsidiaries have direct impact on the greater or lesser degree of communication and sharing of experiences. The lower the centralization, the greater the positive effect on the integration headquarters-subsidiary and between subsidiaries (Nohria & Ghoshal, 1997). An example of this integration is the constant exchange of information between executives from the subsidiary and the headquarters, a strong relationship of work between the units, the traveling of executives and even the expatriation of some executives.

The integration between subsidiary and headquarters is important once it technically reduces the uncertainty regarding the institutional distance. When the corporation is able to implement an integration program, the headquarters acquires greater confidence regarding the subsidiary's operations, since the alignment acquired through the constant exchange of information reduces the perceived environmental uncertainty caused by different institutional conditions between headquarters and subsidiary. Reducing this uncertainty obviously depends on the intensity of the integration and the proper articulation of the corporate organizational structure to host a mechanism of confidence and credibility.

In order to determine the most effective organizational mechanisms for the reverse transfer of knowledge in traditional multinational companies, Bjorkman, Barner-Rasmussen, and Li (2004) found that integration mechanisms, such as visits, trainings and shared tasks, are essential. The authors also conclude that the mechanisms used for the reverse transfer of traditional multinational companies are the same, regardless of the characteristic of the country (developed or emerging)

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where the subsidiary is established. In order to explain the reverse transfer of knowledge at the subsidiary's level in traditional multinational companies, Persson (2006) found that binding mechanisms and temporary teams have positive influence on the process of transfer. Based on the fact that the social interaction between managers from different units of the MNEs is an important stimulus for the intra-organizational transfer of knowledge, Noorderhaven and Harzing (2009) identified a significant effect of social interaction on intra-organizational knowledge flows, emphasizing the importance of this mechanism. Govindarajan and Trimble (2012a) state that for reverse innovation to occur in traditional multinational companies, strengthening the intra-organizational connections, as well as the strategic alignment and optimization of the use of the company's resources, in addition to visits and monitoring, are essential.

In relation to multinational companies coming from emerging markets, Borini et al. (2012) show that the strategic alignment of the headquarters with the subsidiaries is a predominant organizational factor for the reverse transfer of knowledge in Brazilian multinationals. Borini and Fleury (2011) complement showing that in Brazilian multinationals, the reverse transfer of knowledge depends on the internal factors of the organization, such as the integration between headquarters and subsidiaries. Ribeiro and Oliveira Jr (2008), in order to analyze the process of conventional and reverse transfer after the process of international acquisition by Brazilian multinationals, conclude that expatriations and technical visits are seen as key tools in the process of reverse transfer of knowledge.

The same integration that reduces the uncertainty in relation to the foreign environment is a key element to support the headquarters and reverse innovation itself. If there is integration and greater awareness of the subsidiary's activities by the headquarters, the greater the possibility of the headquarters to assign responsibilities and strategic importance to the subsidiary. The integration allows the corporation to establish relationships of trust in the country where the subsidiaries are located. This allows the senior managers of the headquarters to have a greater predisposition to convince the headquarters to provide greater support for the subsidiary to try to bring a new idea to the corporate headquarters (Washburn & Hunsaker, 2011). The authors, after interviewing 52 managers, show how integration is essential for the innovations in emerging markets to be recognized and transferred to the headquarters. Therefore:

> H2a: The integration between headquarters and subsidiary originating from emerging markets is positively associated with the reverse transfer of knowledge.

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H2b: The integration between headquarters and subsidiary originating from developed markets is positively associated with the reverse transfer of knowledge.

3 METHODOLOGY

The study was conducted with the application of two surveys. The data collection instrument used was the closed questionnaire (Collis & Hussey, 2006; Creswell, 2009; Newman, 2006). The universe of foreign subsidiaries in Brazil was chosen based on the size of the companies in terms of revenues. For this, we used the universe of twelve hundred largest multinationals of foreign capital operating in Brazil, obtained based on the companies' revenues provided by Analise Editorial which publishes the Foreign Trade Analysis yearbook. The universe of foreign subsidiaries of Brazilian multinationals were companies with manufacturing activities or professional services abroad, excluding from the analysis commercial representations, stores or distribution centers abroad.

The data were collected through questionnaires via e-mail, with telephone follow-up for the main executive of the subsidiary (president, CEO, vice president). With regard to foreign subsidiaries, we obtained one hundred and seventy two companies, a percentage of 17% of responses, after the exclusion of companies with mailing and data processing problems. This percentage was expected and equivalent, for example, to the survey of Oliveira Jr, Borini, and Guevara (2009), who surveyed foreign subsidiaries in Brazil also based on the largest, in terms of revenues. With regard to the database of the subsidiaries of Brazilian companies, the sample obtained totaled seventy eight Brazilian subsidiaries abroad, which represents 36% of the estimated subsidiaries abroad.

3.1 CONSTRUCTS

All variables are measured on a 5-point Likert scale (Newman, 2006), in one of the extremes the value "1" indicating strongly disagree, bad or low and in the other the value "5" indicating fully agree, excellent or very high, according to each question.

The dependent construct "reverse transfer of knowledge" is adapted from Birkinshaw et al. (1998) and Frost, Birkinshaw, and Ensign (2002). The construct verifies the reverse transfer of skills in the areas of R&D, marketing, production and HR. The Cronbach's Alphas are 0.756 for the Brazilian sample and 0.706 for the foreign sample.

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There are two independent constructs: networks and integration.

The construct "networks" was based on (Doz et al., 2001). It is formed by the following variables: a) Our subsidiary has extensive experience with strategic partnerships and alliances with our suppliers; b) Our subsidiary has a long history in the preparation and development of partnerships in the past; c) Developing partnerships is a common practice of our subsidiary; d) Our subsidiary is always looking for opportunities to make new strategic alliances and partnerships. The Cronbach's Alphas are 0.84 for the Brazilian sample and 0.81 for the foreign sample.

The construct "integration" (Nohria & Ghoshal, 1997) verifies the degree of integration between subsidiary and headquarters in terms of: a) strong working relationship; b) strong exchange of knowledge; c) constant travel of executives to the headquarters. The Cronbach's Alphas are 0.87 for the Brazilian sample and 0.90 for the foreign sample.

3.2 CONTROL VARIABLES

One of the control variables is the period of existence of the subsidiary (dummy 0 for companies that entered before 2000 and 1 for companies that entered after 2000). The variable entry mode is another control dummy (0 for acquisition and 1 for greenfied).

4 RESULTS

Tables 1 and 2 show the correlation data, the means and standard deviations of the constructs for the samples of Brazilian and foreign subsidiaries, respectively. The subsidiaries make a moderate assessment of the integration with the headquarters and low assessment of the insertion in business networks and in the development and transfer of knowledge in the emerging market in question (Brazil). In turn, foreign subsidiaries indicate higher figures in the three items compared with Brazilian subsidiaries.

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Table 1 - Brazilian Subsidiaries Correlation

		Mean	Deviation	I	II	III
I	Knowledge Transfer	1.90	1.12	1		
II	Integration	3.90	1.07	0.251**	1	
III	Network	2.15	0.99	0.396**	0.155	1
**P < 0.01 and *P < 0.05						

Table 2 - Foreign Subsidiaries Correlation

		Mean	Deviation	I	II	III
I	Knowledge Transfer	3.08	0.78	1		
II	Integration	4.07	0.76	0.363**	1	
III	Network	2.84	0.72	0.361**	0.225**	1
**P < 0.01 and *P < 0.05						

Note. Source: authors.

The correlations between the independent variables are low when significant. It initially satisfies one of the assumptions of the regression, which is the lack of strong correlation between the independent variables. Initially, the results show that, for the foreign sample, the dependent variable transfer of knowledge is correlated with all independent variables, whereas in the sample of Brazilian subsidiaries the dependent variable transfer of knowledge is only correlated with the construct of networks. The diagnosis of the lack of multicollinearity is evidenced through the VIF tolerance test (Tables 3 and 4) lower than five, which is in accordance with the reference adopted (Maroco, 2010).

In order to test the hypotheses and assess the explanatory power of the independent variables in the constitution of the dependent variable, we performed a multiple linear regression based on the dependent construct "reverse innovation". Tables 3 and 4 show the results generated by the multiple linear regression model for the samples of national subsidiaries and foreign subsidiaries, respectively.

Model 1 shows the relationship of dependency with the control variables. Models 2 and 3, in addition to the control variables, respectively add the constructs of integration and networks. Finally, model 4 shows the modeling with all the variables together.

The results suggest that knowledge transfer is largely explained by the inclusion in the business networks existing in the country. When comparing models 3 and 4, it can be seen that the construct of networks exerts a greater weight on the predictive power. There are, however, different impacts for the samples when analyzing the influence of the integration of the subsidiary with the headquarters regarding the development and transfer of skills, where the effect appeared to be insignificant for national subsidiaries and significant for foreign subsidiaries.

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The control variables period of existence and entry mode does not appear as significant for the development and transfer of skills for both national and foreign subsidiaries.

Table 3 - Regression Model – Brazilian Subsidiaries

Knowledge Transfer	Model 1	Model 2	Model 3	Model 4	VIF
Constant	2.070	1.050	1.018	.335	
Period of existence	-.364	-.181	-.419	-.243	1.139
Entry mode	.077	.056	.055	.041	1.077
Network		0.428**		0.385**	1.079
Integration			0.281*	.219	1.045
F	0.768	4.01*	2.19	3.92**	
R^2 adjusted	0	0.122	0.052	0.153	
**P < 0.01 and *P < 0.05					

Table 4 - Regression Model - Foreign Subsidiaries

Knowledge Transfer	Model 1	Model 2	Model 3	Model 4	VIF
Constant	3.108	1.993	1.584	.944	
Period of existence	-.203	-.136	-.184	-.133	1.010
Entry mode	.044	.086	.076	.104	1.006
Network		0.382**		0.311**	1.066
Integration			0.371**	0.306**	1.055
F	1.936	8.94**	9.37**	11.58**	
R^2 adjusted	0	0.122	0.128	0.204	
**P < 0.01 e *P < 0.05					

Note. Source: authors.

Therefore, the results confirm the hypotheses H1a, H1b and H2b presented and rejects H2a. Thus, it is possible to establish the following statements. The greater the inclusion of subsidiaries in business networks in international contexts (for Brazilian subsidiaries) and in the context of emerging country (for foreign subsidiaries) the greater the development and reverse transfer of knowledge. The type of subsidiary (Brazilian or foreign) proved to be relevant when analyzing the integration of the subsidiary with its respective headquarters, whereas for foreign subsidiaries, it can be said that the more integrated it is with the headquarters the greater the development and transfer of innovations, but the same is not true for Brazilian subsidiaries.

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5 DISCUSSION

Based on the results presented, it is possible to make a few considerations. Initially, we point out the intersection of information derived from two databases, one of subsidiaries from emerging markets and the other of subsidiaries from developed economies. That said, it is possible to note firstly that both samples agree with respect to the importance of being inserted in business networks in the environment where they are settled. This insertion could mean, in the case of subsidiaries from emerging countries, greater access to technology (Figueiredo, 2005; Kim, 1997) or act as a facilitator for their internationalization (Mathews, 2006). As for the subsidiaries from developed countries, this insertion may improve the suitability of their products to the needs of emerging countries or even make use of an eventual innovation of these markets (Eyring et al., 2011; Govindarajan & Trimble, 2012b) and for the latter case, characterizing what the literature established as reverse transfer of knowledge. The results suggest that in fact companies from both emerging markets and developed markets visualize competitive advantages when being part of alliances with other companies, thus making efforts for their development. These results confirm the studies of (Govindarajan & Trimble, 2012a) who defined emerging markets as a source of innovation for companies from developed markets and with other studies (Govindarajan & Ramamurti, 2011a; Ramamurti, 2008) suggest that companies from emerging markets are becoming a strong competitor for the companies already established when going beyond their borders.

Secondly, there is a fundamental difference between the samples that guided this study with regard to the effects of the integration between the headquarters and their respective subsidiaries. The international business literature emphasizes, among other factors, the importance of integration for the reverse transfer of knowledge (Borini & Fleury, 2011; Noorderhaven & Harzing, 2009); however, the results found in this study suggest that only the sample consisting of the subsidiaries from developed markets follow this understanding. Conversely, this study found no evidence, for the investigated, that the integration between subsidiaries from emerging markets and their headquarters significantly affect the reverse transfer of knowledge. One possible explanation may be addressed to the fact that corporations from contexts still under development have failed to introduce an integration program that brings them closer and promotes greater confidence between the headquarters and its subsidiaries, in order to offer greater support to the international operations of the subsidiaries. Another explanation may be related to the strategic direction of the subsidiaries arising from emerging markets, which are much more interested in accessing the technology and

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knowledge available in environments of developed economies from the external network, leaving its internal network in the background.

Finally, the results suggest that the age of the companies and how they entered the developed or emerging markets have no relationship with the transfer of knowledge between the subsidiary and its parent company.

6 CONCLUSION

This study was concerned with two factors indicated in the literature as drivers of the reverse transfer of knowledge: business networks and the integration between headquarters and its subsidiary. The study provides an important contribution by comparing two databases, one from developed countries and the other from an emerging country.

The results suggest that, in fact, business networks are a global reality that decisively impacts on the competitiveness of the companies when promoting the exchange of knowledge, expertise, access to markets and technologies. As a result, both subsidiaries from developed markets and from emerging countries indicated a strong impact of this collaborative strategy with the development and transfer of knowledge to their respective headquarters.

This paper also contributes by analyzing the impact of both external and internal networks, checking the influence of the integration between subsidiary and its headquarters and the understanding of this relationship on the reverse transfer of knowledge. It was found that the subsidiaries from developed markets make use of both the resources of the inter-organizational network (external) and intra-organizational network (internal), that is, they are inserted in the networks of companies that make up the emerging market and also interact with their headquarters located in a developed market. The same occurs in a partial manner for the subsidiaries from emerging markets; these subsidiaries are focused on accessing the knowledge and technologies that the developed market can offer them and for that, they try to enter inter-organizational networks abroad, relegating the intra-organizational network to the background.

By investigating the operation of multinationals in emerging markets and multinationals from emerging countries abroad, this study contributes to the understanding of the strategies of these companies and confirms some points raised by the literature on international business, such as: i) that external networks are important for multinationals from developed economies for facilitating the entry into emerging markets (Eyring et al., 2011; Govindarajan & Trimble, 2012a)

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and for the transfer of knowledge that could be used in other emerging markets; ii) for the subsidiaries from emerging countries the external networks may allow greater access to the technologies present in developed markets (Figueiredo, 2005; Kim, 1997) or act as a facilitator for their internationalization (Mathews, 2006) and finally, iii) the differences between developed and emerging markets were more evident regarding the use of the internal and external network for the subsidiaries from developed economies and only external networks for the subsidiaries from emerging countries.

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