

Transfer of socially complex knowledge in mergers and acquisitions

Carmen Castro Casal and Edelmira Neira Fontela



Carmen Castro Casal and Edelmira Neira Fontela are both based in the Faculty of Economics and Business Administration, University of Santiago de Compostela, Santiago de Compostela, Spain.

Abstract

Purpose – Taking the literature on knowledge and mergers and acquisitions as a basis, the purpose of this paper is to analyze some variables that influence the knowledge transfer in mergers and acquisitions.

Design/methodology/approach – Using data from a sample of 57 domestic Spanish mergers and acquisitions this paper examines the influence on the transfer of knowledge from the acquired firm to the acquiring firm (or lead firm) of: the socially complex nature of the knowledge to be transferred, the knowledge base of the acquiring firm, and two dimensions of the integration process. In addition, the paper analyses the moderating effect of socially complex knowledge on the relationship: dimensions of the integration process-knowledge transfer.

Findings – The results obtained show that the social complexity of the knowledge, the knowledge base existing in the acquiring firm, and the frequency of rich communication media have a positive influence on knowledge transfer.

Research limitations/implications – The results should be interpreted with caution due to the size of the sample. Since the study was conducted in Spain the results could be affected by the cultural context. Further studies are required in order to corroborate the results and to explore these relationships over a longer period of time.

Practical implications – This paper offers several recommendations to help managers to improve knowledge transfer in mergers and acquisitions.

Originality/value – This study tests empirically a model of knowledge transfer in mergers and acquisitions that integrate key factors that can affect knowledge transfer success. This study can help one to understand the knowledge transfer better and complements the very few studies hitherto produced.

Keywords Acquisitions and mergers, Knowledge transfer, Integration, Spain

Paper type Research paper

1. Introduction

In an era characterized by globalization, the speed of technological change, the reduction of product life cycles, tighter development times and the blurring of the boundaries between industries, the maintenance of competitive advantage by organizations depends mainly on broadening and continually renewing their capabilities by developing, capturing and applying new sources of knowledge (Argote and Ingram, 2000; Tsang, 2002).

Mergers and acquisitions (M&As) are a means of reinforcing existing capabilities and of accessing a new set of valuable capabilities (Ranft, 1997; Karim and Mitchell, 2000; Ahuja and Katila, 2001; Ranft and Lord, 2002), which are difficult to imitate, not widely available, and integrated in an indivisible part of another firm (Haspeslagh and Jemison, 1991). M&As permit the firm to avail itself of valuable capabilities possessed by the acquired organization in a shorter time than would be needed to develop them internally (Karim and Mitchell, 2000).

For the potential of the M&As to materialize, the capabilities and knowledge considered critical must be transferred to the firm that does not possess them. Despite its importance,

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the transfer of knowledge in M&As has received very little attention, significantly less than has been devoted to the transfer of knowledge within organizations (Szulanski, 1996; Tsai, 2001) or in alliances (Simonin, 1999; Tsang, 2002). However, knowledge transfer in M&As requires specific management processes, as the combinations of firms involve the joining of two “social communities” (Bresman *et al.*, 1999, p. 442) that had been independent until the deal was closed, whose cultures and practices may be different.

It is argued that, for the transfer of knowledge in M&As to be successful, it is necessary to take into account the nature of the knowledge to be transferred (Ranft, 1997; Bresman *et al.*, 1999) and the process of integration between the organizations (Haspeslagh and Jemison, 1991; Larsson and Finkelstein, 1999). However, very few studies have tested these relationships, with the exception of Ranft (1997) in the context of technology-driven acquisitions and Bresman *et al.* (1999) in the context of international acquisitions.

Recently, Ranft and Lord (2002) have proposed a model of knowledge transfer during acquisition implementation. Basing themselves on the in-depth study of seven cases of high-technology acquisitions they developed a set of propositions regarding the influence of the nature of the knowledge to be transferred and various dimensions of acquisition implementation (speed of acquisition implementation, autonomy, communications and retention) on the appropriation of technologies and capabilities by the acquirer. Nevertheless, as the authors acknowledge, larger-scale empirical efforts are required to statistically assess these relationships (Ranft and Lord, 2002, p. 438). Furthermore, although the literature has pointed out the importance of the receiver’s knowledge base as a factor that influences the transfer, this relationship has received very little empirical attention in M&As.

The purpose of this paper is to develop a better understanding of knowledge transfer in M&As by analysing data from 57 domestic M&As made by Spanish firms, covering a wide variety of industries. The first aim of this study is to analyze the influence on the transfer of knowledge from the acquired firm to the acquirer (or dominant partner) of the socially complex nature of the knowledge to be transferred and of the knowledge base possessed by the acquiring firm. Additionally, this study analyses the influence of two dimensions of the integration process – the rate of retention of key acquired employees and the frequency of rich communications. The second objective is to empirically examine the moderating effect of the social complexity of the knowledge to be transferred on the relationship between the two dimensions of the integration process and knowledge transfer.

The paper is structured as follows: first to establish the conceptual bases that guide the study and propose a set of hypotheses. Then they are tested empirically on a sample of 57 Spanish domestic M&As. Finally, the results are discussed, pointing out the main limitations of the study and indicating possible future lines of research.

2. Theory and hypotheses

Most research in the field of M&As has started out from the premise that the creation of value in M&As depends on the transfer of capabilities and knowledge being carried out successfully during the integration phase. The acquisition of a firm with potentially valuable capability and knowledge does not necessarily mean that the acquiring firm will benefit from this capability and knowledge.

Important to the transfer are the nature of the knowledge to be transferred (Ranft, 1997; Ranft and Lord, 2002), the knowledge base of the acquiring firm (Cohen and Levinthal, 1990) and

“The acquisition of a firm with potentially valuable capability and knowledge does not necessarily mean that the acquiring firm will benefit from this capability and knowledge.”

the management of the integration process (Haspeslagh and Jemison, 1991; Larsson and Finkelstein, 1999). Furthermore, the nature of knowledge to be transferred may moderate the effect of the dimensions of the integration process on the knowledge transfer.

2.1 Nature of the knowledge to be transferred: socially complex knowledge

The knowledge-based theory highlights the importance of knowledge as a fundamental resource from the point of view of strategy (Grant, 1996; Argote and Ingram, 2000). Conner and Prahalad (1996, p. 477) have affirmed that “the central theme emerging in the strategic management resource-based literature is that privately held knowledge is a basic source of advantage in competition. The resource-based view generally addresses performance differences between firms using asymmetries in knowledge (and in associate competencies or capabilities)”.

Various taxonomies have been devised to classify knowledge. For example, Winter (1987) identified four dimensions: tacit vs articulable; not observable vs observable in use; complex vs simple; and dependent vs independent of a system. Zander and Kogut (1995) developed the five central constructs of knowledge: codifiability, teachability, complexity, system dependence, and observability. Grant (1996) classifies knowledge into knowing about – covering facts, theories and sets of instructions – and knowing how – involving skills that are expressed through performance.

A basic premise in this field is that the extent to which knowledge is transferred within a firm or between firms depends on the nature of the knowledge. This study, following Ranft (1997) and Ranft and Lord (2002), focuses on the socially complex character of the knowledge.

The concept of socially complex knowledge refers to the ways in which knowledge is distributed and shared among members of a group or organization. Socially complex knowledge does not, then, reside in a single individual but in the way in which the various members of the group interact. Berman *et al.* (2002, p. 16) point out that “without the experience of working with each other, the individuals will not have had the chance to construct the interpretative cognitive schemata – or patterns – required for successful mutual adjustment”. Hence the group’s knowledge will be greater than the sum of the knowledge of its members. This type of knowledge is similar to embedded knowledge, which according to Badaracco (1991, p. 79), “resides primarily in specialized relationships among individuals and groups and in the particular norms, attitudes, information flows, and ways of making decisions that shape their dealings with each other”.

There is broad agreement that the more socially complex the knowledge:

- the more difficult it is for competitors to imitate it, so it constitutes a more solid base for competitive advantage; and
- the slower or more difficult it is to transfer (Winter, 1987; Brown and Duguid, 1991; Zander and Kogut, 1995; Grant, 1996; Szulanski, 1996).

The social complexity of the knowledge raises barriers that must be overcome if it is to be transferred and used in other contexts. Therefore it is proposed that:

H1.

The more socially complex the knowledge to be transferred, the less knowledge will be transferred to the acquiring firm in the first year following the M&A agreement.

2.2 Knowledge base of the acquiring firm

It has been pointed out that the knowledge base already possessed by the receiving unit influences the transfer. According to Cohen and Levinthal (1990, p. 131):

Learning is cumulative, and learning performance is greatest when the object of learning is related to what is already known.

Szulanski (1996) confirmed that one of the greatest barriers to the transfer of knowledge within a firm was the receiver’s lack of absorptive capacity. Absorptive capacity refers to the



“It is widely recognized that M&As generate an increase in the turnover of acquired personnel.”

stock of prior related knowledge that the receiver possesses. When the receiving unit has previous experience in a particular domain of knowledge it can learn more quickly, because its knowledge base means that it is familiar with the context and the content of the information (Zander and Kogut, 1995; Simonin, 1999). For this reason, it is proposed that:

- H2. The more closely related the acquiring firm's knowledge base is to the knowledge to be transferred, the greater the transfer of knowledge to the acquiring firm in the first year following the M&A agreement.

2.3 Integration process

Two dimensions of the integration process have potential to influence the transfer of knowledge from the acquired firm to the acquirer or dominant partner:

1. The rate of retention of valuable personnel of the acquired firm (Ranft, 1997; Ranft and Lord, 2000, 2002).
2. The frequency of rich communication between the personnel of the combined firms (Ranft, 1997; Bresman *et al.*, 1999; Ranft and Lord, 2002).

It is widely recognized that M&As generate an increase in the turnover of acquired personnel. Human resources, particularly those of the acquired firm, face considerable potential change. Uncertainty as to the personal consequences of the M&A, job insecurity, as well as collision with norms and systems, especially when there is a need for coordination and interdependence, generate a high level of anxiety and conflict that may endanger the achievement of synergy and the transfer of capabilities and knowledge (Buono and Bowditch, 1989; Larsson and Finkelstein, 1999).

Some authors (Cannella and Hambrick, 1993; Zollo and Singh, 1998) argue that the departure of top executives from acquired firms reduces the performance of the M&A. The reasons for this reduction are the disruptions created by increasing levels of uncertainty and by organizational conflict, as well as the loss of human and social capital.

Other studies (Roberts and Mizouchi, 1989; Ernst and Vitt, 2000; Ranft and Lord, 2000) confirm that the loss of other groups of employees can compromise the success of M&As. Although the senior managers are fundamental in establishing the agenda for core competency building, in general it is the employees at lower levels who develop and maintain the competency. According to Ranft and Lord (2000) the retention of key personnel is a precondition for the successful appropriation of capabilities by the acquirer. If the personnel in whom the knowledge is rooted leave the firm, it cannot be transferred.

Therefore it is proposed that:

- H3. The higher the rate of retention of the personnel of the acquired firm who possess the valuable knowledge, the more knowledge will be transferred to the acquiring firm in the first year following the M&A agreement.

Although the retention of key employees is seen as a necessary condition for the transfer of knowledge, it is not sufficient; rich communication among the personnel of the two firms must be encouraged. Rich media are personal and involve face-to-face contact between transmitter and receiver, and facilitate the reduction of equivocality by enabling people to overcome differences between frames of reference and by providing the capacity to process complex, subjective messages (Daft and Lengel, 1986) The study by Ranft (1997) of 75 acquisitions in high-technology sectors discovered that the frequency of rich

communication favors the transfer of knowledge irrespective of its nature. Similarly, the study by Castro and Neira (2005) of three acquisitions of firms supports the importance of interpersonal communications for transferring the knowledge of the acquired firm to the acquirer. Therefore it is proposed that:

- H4.* The higher the frequency of use of rich communications between the personnel of the acquired firm who possess the valuable knowledge and the receiving personnel of the acquiring firm, the greater the transfer of knowledge to the acquiring firm in the first year following the M&A agreement.

2.4 Moderating effect of socially complex knowledge

Previous research into knowledge transfer in M&As has posited that the type of knowledge to be transferred may moderate the effect of the dimensions of the integration process – in this case, the rate of retention and the frequency of rich communications – on the transfer of knowledge achieved (Haspeslagh and Jemison, 1991; Ranft, 1997; Bresman *et al.*, 1999).

The importance of the retention of acquired personnel on the transfer of knowledge in M&As may be influenced by the type of knowledge to be transferred. Socially complex knowledge is linked to the context in which it is developed and used, and depends to a large extent on the relative stability of the set of individuals who make up the group (Berman *et al.*, 2002). The importance of retention will be the greater the more socially complex the knowledge, given that the departure of one person not only involves the loss of his individual knowledge, but may also modify the social structure of the group of which he formed an essential part, prejudicing capability (Ranft and Lord, 2002). When the most valuable capability of the acquired firm is based on a relationship of cooperation among individuals and on the patterns of interaction that they have developed, rather than on the knowledge of a particular individual, it is more fragile, and the risk of deterioration is therefore greater. Also, due to the importance of relationships, the departure of one member of the group could demoralize the rest of its members, and even encourage others to leave.

Therefore it is proposed that:

- H5.* The more socially complex the knowledge to be transferred, the greater the positive influence on the transfer of knowledge to the acquiring firm of the rate of retention of the personnel of the acquired firm who possess the valuable knowledge.

Given that the socially complex knowledge is developed in the course of time through the shared experiences of the members of the group and through learning, transferring it requires close personal interaction (Winter, 1987; Bresman *et al.*, 1999) among the various individuals who possess partial knowledge and the receivers. Furthermore, the frequency of rich communication contributes to the creation of a favorable climate for the individuals of both sides to collaborate, foments trust and promotes the creation of social ties (Bresman *et al.*, 1999), aspects of particular importance when the knowledge to be transferred is of a socially complex character. Therefore it is proposed that:

- H6.* The more socially complex the knowledge to be transferred, the more positive the influence of the frequency of rich communication between the personnel of the acquired firm who possess the valuable knowledge and those receiving the knowledge in the acquiring firm.

The model that includes the main effects and the moderate effects to be tested is shown in Figure 1.

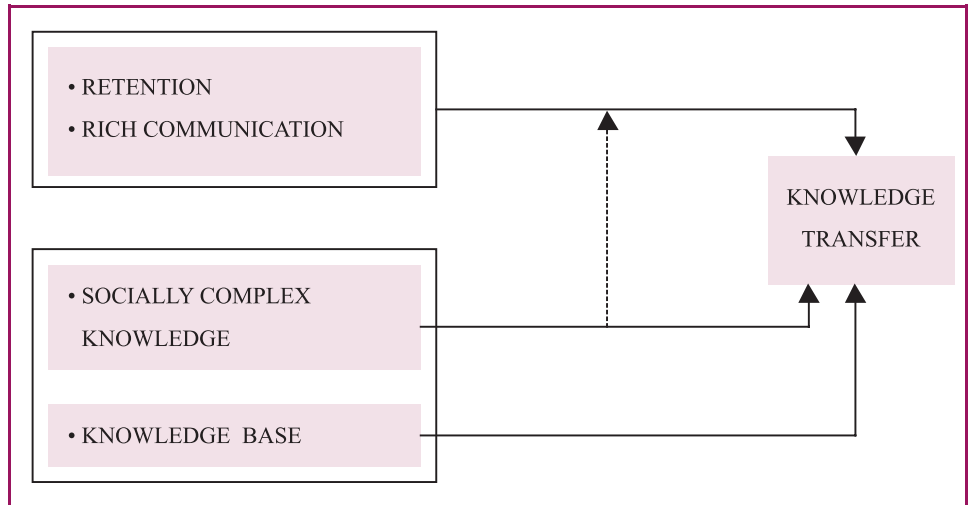
3. Methodology

3.1 Sample and data collection

The population consists of the firms that carried out domestic merger or acquisition operations in Spain, in the period between January 1995 and March 2000[1]. The information was obtained from two sources: The firm Infotel, on the basis of the records of the



Figure 1 Transfer knowledge model in M&As



Boletín Oficial del Registro Mercantil, lists the merger operations occurring during this period. The only condition established was that that the size of the absorbing firm should exceed 50 employees. Since the above information was not complete, an alternative source for the same period, Thomson Financial Securities Data was consulted.

When a firm made various M&As in the interval of the study, the manager (key informant) was asked to choose one in which it had been attempted to transfer skills and capabilities[2]. Altogether 435 questionnaires were sent[3], addressed to top managers of the acquiring firms or those resulting from merger, between April and June 2001.

Of the 62 questionnaires received, five were eliminated: one because it corresponded to a hostile takeover, when the rest were friendly; two because their aim was not to transfer the capability of the acquired firm to the acquirer[4]; one because it was incomplete and another because the operation had not been carried out within the period of analysis. In total, 57 usable surveys were received, representing a 14 percent response rate. This percentage, though modest, is satisfactory given the high level of responsibility of the managers consulted[5] and the indices documented in the studies of M&As (Pablo, 1994; Very *et al.*, 1997) and knowledge transfer (Zander and Kogut, 1995; Lane and Lubatkin, 1998; Bresman *et al.*, 1999), the majority very low. In addition, the response rate is above the 10-12 percent rate often experienced when surveying top management (Geletkanycz, 1997). Therefore, although the sample is small, it is consistent with the sample sizes used in this area of research.

A total of 42.1 percent of the operations analyzed are mergers and 57.9 percent acquisitions; and the great majority between firms of the same industry. Among the acquiring firms, or dominant partners, the industries that stand out are construction (8.8 percent), telecommunications (8.8 percent), distribution (8.8 percent), chemicals (7 percent) food (5.3 percent), automobile (5.3 percent) and pharmaceutical (3.5 percent). The rest are distributed among a variety of industries (law, audit, mining, finance and insurance, etc.). For the acquired firms, the distribution follows practically the same pattern, except for the presence of Internet firms (7 percent), which were the target, in general, of telecommunications firms.

Most of the managers who replied to the questionnaire belonged, before the operation, to the acquiring firm or the dominant partner (80.7 percent).

3.2 Measures

Most of the data required to measure the constructs in this study are not available from archival sources. Therefore, data were gathered through a survey of key informants. Prior to



sending the questionnaire several interviews were carried out with top managers involved in five M&As. These interviews permitted a better appreciation of how firms manage the transfer of knowledge in M&As, to explore the degree of understanding of the various questions posed in the research, and to refine the measures used. During the interviews the content of the questionnaire and the wording of the various items were discussed, on order to ensure that they were understood and interpreted accurately.

In the questionnaire managers were asked to select, from a list developed by Ranft (1997), the capability of the acquired firm that was considered most valuable by the acquiring firm or dominant partner. The capability of the acquired firm considered most valuable by the majority of the acquiring firms was sales relationships and customer knowledge (49 percent), followed by research capability (14 percent), product technology (12 percent) and process or production technology (10 percent). The rest were distributed among engineering capability, managerial capability, marketing expertise and supplier relationships and knowledge.

The social complexity of knowledge was measured by one item, which reflected the degree in which the fundamental capability of the acquired firm is the result of the interaction and collaboration of many people (Badaracco, 1991; Brown and Duguid, 1991). The scale was a seven-point Likert-type scale (1: strongly disagree; 7: strongly agree).

To measure the knowledge base of the acquiring firm by means of the capability considered most valuable, the two items of the scale used by Simonin (1999) referring to the level of expertise and experience with the partner's technology/process know-how respectively, were adapted to the context of M&As. However, the opinions of the managers interviewed in the first part of the study led to the consolidation of two items into one that expressed the notion of Cohen and Levinthal (1990) and Lane and Lubatkin (1998) that, the less the distance between the knowledge of the source and that of the receiver, the greater the probability of assimilating the knowledge. Therefore, this variable is measured by a single item ("before the M&A, the acquiring firm possessed the knowledge base necessary to be able to assimilate the capability of the acquired firm or merger partner") on a seven-point Likert scale (1: strongly disagree; 7: strongly agree).

To measure the rate of retention of the personnel of the acquired firm who possessed the valuable knowledge, the managers were asked to indicate the real percentage of these personnel who remained in the firm at the end of the first year after the deal was closed.

The frequency of use of "rich" communications between the personnel of the acquired firm who possessed the valuable knowledge and the receiver of the knowledge in the acquiring firm, during the first year after the M&A, was measured on a seven-point Likert scale as follows:

- the means of communication was grouped into two types – written and personal (Daft and Lengel, 1986);
- asked about the frequency of their use (1: never, 7: very frequently);
- they were weighted according to their degree of richness for the managers interviewed (0.3 written means; 0.7 personal means); and finally
- the weighted sum of the use of both types of means of communication was calculated.

To measure the transfer of knowledge at the end of the first year after the M&A agreement, the managers were asked to indicate, with reference to the capability considered most valuable, what had been the level of transfer of knowledge from the acquired firm to the acquirer. The scale used was of the seven-point Likert type: (1: nothing at all transferred; 7: totally transferred).

The size of the acquired firm relative to the acquirer was used as a control variable. It can be argued that the larger the size of the acquired firm in relation to the acquirer, the more difficult it will be for the latter to understand all aspects of the former (Shrivastava, 1986), which will negatively affect the transfer of knowledge. The relative size was calculated as a rate



between the number of employees of the acquired firm and that of the acquiring firm. The number of employees has been used in previous studies (Pablo, 1994).

4. Results

Table I presents summary means, standard deviations and Pearson correlation coefficients of the variables.

The transfer of knowledge at the end of the first year of the M&A agreement is significantly positively correlated with the social complexity of the knowledge (0.442, $p < 0.001$); with the knowledge base of the acquiring firm (0.589, $p < 0.001$); with the frequency of rich communications (0.395, $p < 0.01$); with the interaction between the socially complex knowledge and the retention of key personnel (0.357, $p < 0.001$) and with the interaction between the socially complex knowledge and the frequency of rich communications (0.501, $p < 0.001$). There are no significant correlations among the independent variables.

Table II reports the results of the hierarchical multiple regression models that were used to test the hypotheses. Prior to the analysis, the independent variables were centered to reduce the problem of multicollinearity (Aiken and West, 1991). Additionally, to examine the presence of multicollinearity, the variance inflation factor (VIF), which evaluates the extent to which the relationships among the independent variables inflate the standard error, was

Table I Descriptive statistics and correlations ($n = 57$)

Variables	Mean	SD	1	2	3	4	5	6	7
1. Relative size	0.42	0.45							
2. Social complexity of knowledge	3.78	1.70	-0.138						
3. Knowledge base	5.40	1.61	-0.146	0.066					
4. Retention	88.02	18.30	-0.123	0.149	-0.050				
5. Rich communication	5.24	1.38	0.011	0.113	0.214	0.066			
6. Social complexity of knowledge × retention	337.43	169.86	-0.154	0.935*	0.034	0.465*	0.127		
7. Social complexity of knowledge × rich communication	20.08	10.85	-0.081	0.855*	0.165	0.154	0.563*	0.814*	
8. Knowledge transfer	5.24	1.68	-0.096	0.442*	0.589*	-0.089	0.395**	0.357*	0.501*

Notes: * $p < 0.001$; ** $p < 0.01$; *** $p < 0.05$

Table II Results of hierarchical regression analysis ($n = 57$)

	Model 1 Control variable	Model 2 Effects of knowledge variables on knowledge transfer	Model 3 Effects of independent variables on knowledge transfer	Model 4 Moderating effect of social complexity
B_0	5.229*	5.252*	5.270*	5.326*
Relative size	-.363	0.171	0.055	0.162
Social complexity		0.416*	0.406*	1.375***
Knowledge base		0.601*	0.534*	0.533*
Retention			-0.013	-0.007
Rich communication			0.301**	0.851**
Social complexity × retention				-0.002
Social complexity × rich communication				-0.153***
R^2	0.009	0.511	0.583	0.629
Adjusted R^2	-.011	0.481	0.538	0.571
F	0.464	16.736*	12.872*	10.678*
ΔR^2		0.502	0.072	0.046
ΔF		24.652*	3.970**	2.748

Notes: * $p < 0.001$; ** $p < 0.01$; *** $p < 0.05$; Entries represent unstandardized regression coefficients

calculated. All the VIFs of models 1, 2 and 3 were below 2, far from the recommended threshold of 10 (Neter *et al.*, 1990), suggesting that multicollinearity is unlikely to affect the estimated parameters. In model 4 the above condition is not always fulfilled, indicating that multicollinearity, in this case, could be a problem.

Model 1, which includes only the control variable – relative size – is not significant, indicating that the transfer is independent of the relative size of the participating firms.

Model 2 adds to the control variable the principal effects of the variables relating to knowledge: degree to which the knowledge to be transferred is socially complex, and knowledge base of the acquiring firm or dominant partner. The inclusion of these variables substantially improves the explanatory capacity of the dependent variable. The adjusted R^2 rises to 0.481, the change in R^2 being significant. The results obtained imply that the relationship argued in hypothesis 1 tests contrary to the hypothesis ($b = 0.416$; $p < 0.001$), whereas $H2$ is confirmed ($b = 0.601$; $p < 0.001$).

Model 3 incorporates the principal effects of the variables of the integration process: retention of valuable personnel of the acquired firm, and frequency of rich communications. The adjusted R^2 of the new model is 0.538 and the F-statistic is statistically significant ($F = 12,872$; $p < 0.001$); the change in R^2 is also significant. The results obtained imply that the relationship argued in $H3$ is not confirmed, whereas $H4$ is supported ($b = 0.301$; $p < 0.01$). According to this model, the transfer of knowledge is influenced positively and significantly by the degree to which the knowledge to be transferred is socially complex, by the knowledge base possessed by the acquiring firm, and by the frequency of “rich” communications.

To examine the moderating effect of the socially complex character of the knowledge to be transferred on the relationship between each of the integration process dimensions and the transfer of knowledge ($H5$ and $H6$) model 4 was tested. Support for the hypotheses would exist when:

- the results of the model were significant;
- the interaction term was significant and in the hypothesized direction; and
- the values of the changes in R^2 resulting from the introduction of the interaction term and its associated F were significant.

If these conditions are fulfilled, the inclusion of the interaction variable is considered to increase the explanatory power of the model.

Although the model is significant (adjusted $R^2 = 0.571$, $p < 0.001$), the change in R^2 is not. So the incorporation of the moderating effect of the degree to which the knowledge is socially complex on the dimensions of the integration process does not contribute to improving the explanation of the transfer of knowledge at the end of the first year over the previous model. As the change is not significant, hypotheses 5 and 6 are not confirmed.

5. Discussion and conclusions

The results of the study indicate that, in general terms, the transfer of knowledge is greater the more socially complex the knowledge to be transferred, the greater the acquiring firm's knowledge base, and the greater the frequency of use of “rich” means of communication during the first stage of the integration process.

Two results agree with the expectations deriving from the literature. The first is the strong relationship between the acquiring firm's previous knowledge base and the transfer of knowledge achieved by the end of the first year. According to the results of this investigation, this is one of the factors that most favors the transfer of knowledge. As indicated by the literature, learning is easier when the receivers are prepared to receive the knowledge (Cohen and Levinthal, 1990; Szulanski, 1996).

Although the difference in the endowments of knowledge complements the knowledge of the acquiring firm (Harrison *et al.*, 1991), if the difference is too great, the acquiring firm will not



be able to understand, absorb and assimilate the target's knowledge. Vermeulen and Barkema (2001) have argued that the degree of relationship between the activities of the firms implicated in the M&A moderates the ability to learn. "Acquisitions in unrelated domains may not lead to learning, since the acquiring firm lack the basic knowledge necessary to absorb the new experience" (Vermeulen and Barkema, 2001, p. 469). In this study, most of the operations took place between firms of the same industry, which helps to explain the high knowledge base of the acquiring firms.

The second result found in this study is the strong influence of the frequency of use of "rich" means of communication on the transfer of knowledge in the first year. So, the effort made by the management to increase this type of communications will lead to an increase in the transfer of knowledge, independently of the socially complex character of the knowledge to be transferred. The frequency of rich communication helps to mitigate the anxiety of personnel that is characteristic of M&As, and the lack of trust among the members of the two firms (Buono and Bowditch, 1989), facilitating, therefore, the interaction among the individuals of the two firms (Haspeslagh and Jemison, 1991). This result confirms those obtained by Ranft (1997) and Castro and Neira (2005), who found that the frequency of rich communication among the personnel of the combined firms promoted the transfer of knowledge-based resources, regardless of their nature.

Contrary to the hypothesis put forward, the rate of retention of valuable personnel of the acquired firm does not influence the transfer of knowledge. This result confirms that of Ranft (1997), but does not agree with that of Ranft and Lord (2000) in a broader sample. In this last study the authors confirmed that retention was the main determinant of the transfer of knowledge in acquisitions. The lack of a relationship between the rate of retention of valuable personnel and the transfer of knowledge may be due to the high level of retention found in this sample. This high retention may be a consequence, firstly, of firms' current fears of losing talent. The survey carried out by the Conference Board (1997) revealed that the retention of critical talent was the main area of concern with regard to the organizational aspects of M&As. This fear could lead firms to devise more effective mechanisms of retaining key personnel, and to overvalue the number of key individuals to be retained during the initial period so as to be able to evaluate more precisely who are really the carriers of the knowledge. It has to be taken into account that the acquirers find it difficult to gather complete information on where the acquired firm's knowledge resides before closure of the transaction (Graebner, 2004).

Secondly, the fact that the sample consists of "friendly" operations may explain the high rate of retention. In this sense, the empirical evidence has shown the influence of the degree of friendliness/hostility of the acquisitions on the rate of turnover of the personnel of the acquired firm (Hambrick and Cannella, 1993).

Finally, as suggested by Ranft and Lord (2002), retention can be a means of preserving the knowledge rather than transferring it. Therefore, new studies are necessary to analyze this relationship and permit these conflictive results to be clarified.

One unexpected result is the positive relationship between the socially complex nature of the knowledge and its transfer. Although the literature indicates that the more socially complex the knowledge, the more difficult it will be to transfer, in this study it was found that the socially complex character favors this. The reason for this positive relationship may be that firms perceive that the socially complex knowledge is more valuable from the strategic point of view, as it is more difficult to imitate, and that they make a greater effort to achieve the transfer, so this aim is achieved to a greater extent.

Also, it has to be taken into account that, in this study, when the acquiring firm participated in various M&As, the managers were asked to choose the one which to the greatest extent sought the transfer of capabilities. It could have occurred that they chose the most successful M&A in terms of transfer.

This investigation highlights the importance of proper management of the communication among the members of the combined firms using "rich" means, of taking into consideration



“Although the retention of key employees is seen as a necessary condition for the transfer of knowledge, it is not sufficient: rich communication among the personnel of the two firms must be encouraged.”

the type of knowledge to be transferred, and of careful prior evaluation of the acquiring firm's knowledge base.

6. Limitations and future research

The results should be interpreted with caution due to the size of the sample and the measurement of the constructs. This study uses data from a single respondent. However, given that the constructs cannot be measured directly using archival data, reliance on a key informant is often necessary. Further studies are required in order to corroborate the results and to explore these relationships over a longer period of time.

On the other hand, this study has focused on the knowledge transfer in Spanish M&As. The results obtained could be affected by the cultural context and not be extrapolated to other contexts. In relation to the US, Spanish culture is characterized by a greater level of power distance and uncertainty avoidance (Hofstede, 2001) that hinders communication, risk taking and innovation, delaying knowledge transfer. However, the lesser degree of masculinity in Spanish culture compared to North Americans favors the creation of a collaboration necessary for transferring knowledge. Finally, the level of individualism is less in Spain than in the US, although it is far from the collectivism in Asian cultures. Collectivist cultures are positively associated with knowledge sharing by favoring group work and strong in-group ties. However, this strong in-group orientation is often accompanied by negative feeling toward out-groups (Ashwin, 1996; Ardichvili *et al.*, 2006), which may generate a “we/them” conflict between the firms involved in the M&A (Buono and Bowditch, 1989) and damage the knowledge transfer. Therefore the hypothesis is that the knowledge transfer could be greater in the cultural contexts that act on a medium level in this dimension as in Spain. More studies will be necessary in order to achieve a better appreciation of the cultural dimensions which favor or inhibit knowledge transfer in M&As.

Despite these limitations, the authors believe that the study helps to understand better the transfer of knowledge in M&As and complements the hitherto very few studies by analyzing empirically the moderating effect of the nature of the knowledge on the relationship: dimensions of the process of integration-knowledge transfer, in a wide variety of industries.

Among future lines of research could be the following. First, to examine cases in which the explicit fundamental objective of the acquiring firm is to access a certain capability or knowledge; i.e. combinations oriented specifically towards learning. This study has focused on the knowledge underlying the capability of the acquired firm considered most valuable by the acquiring firm, but independently of the main objective of the operation. As argued by Vermeulen and Barkema (2001, p. 469) “acquisitions can also trigger learning when they were not primarily made for that purpose”. In the same line Graebner (2004) points out that the motives for the acquisition need not correspond exactly to the sources of value that emerge after closure of the agreement.

Secondly, this study has considered the transfer of knowledge as a variable to be explained; new studies should examine whether such transfer translates into better results (profitability, market share, etc.). Thirdly, this study has focused on knowledge transfer from the acquired firm to the acquirer or dominant partner; however, transfer is a reciprocal process, so new studies should analyze transfer from the acquiring firm to the acquiree or both types.



Notes

1. The choice of the period of analysis was based on two criteria: (1) not too distant in time, so that managers would be able to recall with precision how the process was carried out, and (2) at least 12 months between the M&A and the gathering of data so that the transfer of knowledge could take place.
2. This allowed a better focus on the transactions that fit the aims of the study; also it was believed that the time required to fill in several questionnaires would discourage firms from collaborating.
3. Despite the efforts made to refine the information, the bases contained some errors. Thus, five firms informed that they had no experience of merger or acquisition or that the operation had consisted of a collaboration agreement. On the other hand, 25 responses were received explaining the M&As in question did not fit the objective of the study.
4. The questionnaire included an item to verify whether the acquiring firm pursued the transfer of knowledge.
5. The questionnaire was addressed to top managers of the combined firms, for two reasons: (a) the strategic nature of its content requires an overall knowledge of the firms involved in the operation and (b) they are the best able to forward the questionnaire to other persons who have more specialized knowledge of the subject.

References

- Ahuja, G. and Katila, R. (2001), "Technological acquisitions and the innovation performance of acquiring firms: a longitudinal study", *Strategic Management Journal*, Vol. 22 No. 3, pp. 197-220.
- Aiken, L.S. and West, S.G. (1991), *Multiple Regression: Testing and Interpreting Interactions*, Sage Publications, Newbury Park, CA.
- Ardichvili, A., Maurer, M., Li, W., Wentling, T. and Stuedemann, R. (2006), "Cultural influences on knowledge sharing through online communities of practice", *Journal of Knowledge Management*, Vol. 10 No. 1, pp. 94-107.
- Argote, L. and Ingram, P. (2000), "Knowledge transfer: a basis for competitive advantage in firm", *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 150-69.
- Ashwin, S. (1996), "Forms of collectivity in a non-monetary society", *Sociology*, Vol. 30 No. 1, pp. 21-39.
- Badaracco, J.L. (1991), *The Knowledge Link: How Firms Compete through Strategic Alliances*, Harvard Business Press, Boston, MA.
- Berman, S.L., Down, J. and Hill, C.W.L. (2002), "Tacit knowledge as a source of competitive advantage in the National Basketball Association", *Academy of Management Journal*, Vol. 45 No. 1, pp. 13-31.
- Bresman, H., Birkinshaw, J. and Nobel, R. (1999), "Knowledge transfer in international acquisitions", *Journal of International Business Studies*, Vol. 30 No. 3, pp. 439-62.
- Brown, J. and Duguid, P. (1991), "Organizational learning and communities of practice: toward a unified view of working, learning and innovation", *Organization Science*, Vol. 2 No. 1, pp. 40-57.
- Buono, A.F. and Bowditch, J.L. (1989), *The Human Side of Mergers and Acquisitions: Managing Collisions between People, Cultures and Organizations*, Jossey-Bass, San Francisco, CA.
- Cannella, A.A. and Hambrick, D.C. (1993), "Effects of executive departures on the performance of acquired firms", *Strategic Management Journal*, Vol. 14 No. 4, pp. 137-52.
- Castro, C. and Neira, E. (2005), "Knowledge transfer: analysis of three internet acquisitions", *International Journal of Human Resource Management*, Vol. 16 No. 1, pp. 120-35.
- Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35 No. 1, pp. 128-52.
- Conference Board (1997), "HR challenges in mergers and acquisitions", *HR Executive Review*, Vol. 5 No. 2, pp. 1-18.
- Conner, K. and Prahalad, C.K. (1996), "A resource-based theory of the firm: knowledge versus opportunism", *Organization Science*, Vol. 7 No. 5, pp. 477-501.



- Daft, R.L. and Lengel, R.H. (1986), "Organizational information requirements: media richness and structural design", *Management Science*, Vol. 32 No. 5, pp. 554-71.
- Ernst, H. and Vitt, J. (2000), "The influence of corporate acquisitions on the behavior of key inventors", *R&D Management*, Vol. 30 No. 2, pp. 105-19.
- Geletkanycz, M. (1997), "The salience of 'culture's consequences': the effects of cultural values on top executive commitment to the *status quo*", *Strategic Management Journal*, Vol. 18 No. 8, pp. 615-34.
- Graebner, M.E. (2004), "Momentum and serendipity in acquisition implementation", *Strategic Management Journal*, Vol. 25 Nos 8/9, pp. 751-77.
- Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17, pp. 109-22.
- Hambrick, D.C. and Cannella, A.A. (1993), "Relative standing: a framework for understanding departures of acquired executives", *Academy of Management Journal*, Vol. 36 No. 4, pp. 733-62.
- Harrison, J.S., Hitt, M.A., Hoskisson, R.E. and Ireland, R.D. (1991), "Synergies and post-acquisition performance: differences versus similarities in resource allocations", *Journal of Management*, Vol. 17 No. 1, pp. 173-90.
- Haspeslagh, P.C. and Jemison, D.B. (1991), *Managing Acquisitions: Creating Value through Corporate Renewal*, Free Press, New York, NY.
- Hofstede, G. (2001), *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations*, 2nd ed., Sage Publications, Thousand Oaks, CA.
- Karim, S. and Mitchell, W. (2000), "Path-dependent and path-breaking change: reconfiguring business resources following acquisitions in the US medical sector, 1978-1995", *Strategic Management Journal*, Vol. 21 Nos 10/11, pp. 1061-81.
- Lane, P.J. and Lubatkin, M. (1998), "Relative absorptive capacity and interorganizational learning", *Strategic Management Journal*, Vol. 19 No. 5, pp. 461-77.
- Larsson, R. and Finkelstein, S. (1999), "Integrating strategic, organizational and human resource perspectives on mergers and acquisitions: a case survey of synergy realization", *Organization Science*, Vol. 10 No. 1, pp. 1-26.
- Neter, J., Wasserman, W. and Kutner, M. (1990), *Applied Linear Statistical Models: Regression, Analysis of Variance and Experimental Designs*, Richard D. Irwin, Homewood, IL.
- Pablo, A.L. (1994), "Determinants of acquisition integration level: a decision-making perspective", *Academy of Management Journal*, Vol. 37 No. 4, pp. 803-36.
- Ranft, A.L. (1997), "Preserving and transferring knowledge-based resources during post-acquisitions implementation", PhD dissertation, UMI dissertation Services, University of North Carolina, Chapel Hill, NC.
- Ranft, A.L. and Lord, M.D. (2000), "Acquiring new knowledge: the role of retaining human capital in acquisitions of high-tech firms", *Journal of High Technology Management Research*, Vol. 11 No. 2, pp. 295-319.
- Ranft, A.L. and Lord, M.D. (2002), "Acquiring new technologies and capabilities: a grounded model of acquisition implementation", *Organization Science*, Vol. 13 No. 4, pp. 420-41.
- Roberts, E.B. and Mizouchi, R. (1989), "Inter-firm technological collaboration: the case of Japanese biotechnology", *International Journal of Technology Management*, Vol. 4 No. 1, pp. 43-61.
- Shrivastava, P. (1986), "Postmerger integration", *Journal of Business Strategy*, Vol. 7 No. 1, pp. 65-76.
- Simonin, B.L. (1999), "Ambiguity and the process of knowledge transfer in strategic alliances", *Strategic Management Journal*, Vol. 20 No. 7, pp. 595-623.
- Szulanski, G. (1996), "Exploring internal stickiness: impediments to the transfer of best practice within the firm", *Strategic Management Journal*, Vol. 17, pp. 27-43.
- Tsai, W. (2001), "Knowledge transfer in intraorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance", *Academy of Management Journal*, Vol. 44 No. 5, pp. 996-1004.



Tsang, E.W.K. (2002), "Acquiring knowledge by foreign partners from international joint ventures in a transition economy: learning-by-doing and learning myopia", *Strategic Management Journal*, Vol. 23 No. 9, pp. 835-54.

Vermeulen, F. and Barkema, H. (2001), "Learning through acquisitions", *Academy of Management Journal*, Vol. 44 No. 3, pp. 457-76.

Very, P., Lubatkin, M., Caroli, R. and Veiga, J. (1997), "Relative standing and the performance of recently acquired European firms", *Strategic Management Journal*, Vol. 18 No. 8, pp. 593-614.

Winter, S.G. (1987), "Knowledge and competence as strategic assets", in Teece, D.J. (Ed.), *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*, Ballinger Publishing Company, Cambridge, MA, pp. 159-84.

Zander, U. and Kogut, B. (1995), "Knowledge and the speed of the transfer and imitation of organizational capabilities: an empirical test", *Organizational Science*, Vol. 6 No. 1, pp. 76-92.

Zollo, M. and Singh, H. (1998), "The impact of knowledge codification: experience trajectories and integration strategies on the performance of corporate acquisitions", *Academy of Management Proceedings*, San Diego, CA.

About the authors

Carmen Castro Casal is Associate Professor of Strategic Management at the University of Santiago de Compostela. She received her PhD degree from that University. Her research interests include mergers and acquisitions and knowledge management. Carmen Castro is the corresponding author and can be contacted at: oeacara@usc.es

Edelmira Neira Fontela is Professor of Business Administration at the University of Santiago de Compostela. Her lines of research center on the area of Human Resources Management (top management compensation, human resources turnover and professional careers). She is currently working on problems of human resources in mergers and acquisitions.

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