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Subsidiary Capital and Knowledge Integration in the MNC: Evidence from Korean Subsidiaries in Europe

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ABSTRACT

We apply the resource-based view (RBV) at subsidiary level to predict subsidiary knowledge integration in the MNC. In our model, knowledge integration refers to the effectiveness of both knowledge inflows *and* knowledge outflows to / from the overseas subsidiary. RBV suggests that employees in subsidiaries may be encouraged to participate in inter-unit knowledge transfers because of three types of capital. Firstly, human capital logic emphasizes the role of a developed and competitive local workforce. Secondly, social capital logic suggests a role of a local workforce that is well-connected with other units of the MNC. Thirdly, organizational capital logic stresses human resource management practices within the subsidiary and mechanisms for encouraging commitment in employees. We test these three subsidiary level predictors using a questionnaire survey to senior managers in 86 subsidiaries of Korean MNCs in the UK, France and Germany. After controlling for host country, subsidiary age and size effects, as well as knowledge-intensity of the industry, we find strong support for the role of organizational capital: establishing a participative climate *within* the subsidiary enhances both knowledge in- and outflows at the level *of* the subsidiary. Contrary to our expectations, human capital appears to be negatively related to knowledge inflows. Thus we also observe limits of RBV in explaining knowledge inflows and knowledge outflows.

1. INTRODUCTION

One of the most critical strategic resources available to international firms is the knowledge base of the workforce. The mechanisms by which MNCs can develop and transfer knowledge have become a key focus for researchers, consultants and managers. The MNC's effectiveness in transferring knowledge is a key determinant of competitive advantage and performance in the global environment. Consequently, the phenomenon of knowledge transfer has attracted much attention from researchers in the field of MNC management (e.g., Björkman, Barner-Rasmussen, & Li, 2004; Gupta and Govindarajan, 2000). However, knowledge transfer within MNCs is no mean feat. Scholars have pointed out that a subsidiary's ability to learn (absorptive capacity), its willingness to share and to learn (motivational disposition) and the nature of inter-unit relationships (corporate socialization) can all act as impediments to knowledge transfer (Björkman et al., 2004; Gupta and Govindarajan, 2000; Minbaeva, Pedersen, Björkman, Fey, & Park, 2003).

We approach the question of what determines successful knowledge transfer into and out of subsidiaries using the resource-based view (RBV) (Barney, 1991; Barney, 1995; Barney, Wright, & Ketchen Jr., 2001; Wernerfelt, 1984). Scholars have recently highlighted this theory as a predominant perspective in understanding international human resources (Morris, Snell and Wright, 2006; Wright, Dunford and Snell, 2001). In particular, RBV is very relevant to understanding knowledge dynamics within MNCs as it emphasizes idiosyncratic factors - over which the firm has some control – that act as sources of resource heterogeneity and competitive advantage. We argue in this paper that primary sources of advantage through inter-unit knowledge transfer reside within the management practices (especially the human resource management (HRM) practices) of subsidiaries. More precisely, three important forms of capital underpin the competitive capability to transfer knowledge effectively into and out of subsidiaries (i.e., the knowledge integration of the

subsidiary). These are human, social, and organizational forms of capital (Morris et al., 2006).

In our view there remains a gap in our understanding of the relationship between MNC knowledge integration and various forms of subsidiary capital. Prior research has emphasized the association between corporate socialization and knowledge transfer (Gupta and Govindarajan, 2000; Minbaeva et al., 2003). Others have examined HRM practices in terms of their impact on organizational performance (Barton and Delbridge, 2004; Laursen and Foss, 2003). However, how various forms of capital within subsidiaries may influence employee motivation to send and receive knowledge in a useful way remains under-researched. Indeed, few have examined the effect of a range of HRM practices on knowledge-related phenomenon (Minbaeva, 2005).

We address this gap in this paper. By examining the relationship between various forms of capital within MNC subsidiaries and knowledge transfer, we are able to identify those capabilities within subsidiaries that matter most to knowledge inflows and outflows. Our conceptual model contains three hypotheses derived from RBV. The hypotheses were tested using a questionnaire survey of senior managers in 86 subsidiaries of Korean MNCs located in the United Kingdom, France, and Germany. The main finding of this study is that organizational capital (in particular, encouraging employee participation) within the subsidiary has the strongest positive impact on knowledge integration at the level of the subsidiary. In other words, by encouraging a participative environment locally, the subsidiary organization becomes more integrated into the wider MNC. Secondly, we observe that the various forms of capital do not have a uniform affect on knowledge inflows and knowledge outflows. Surprisingly, we find human capital in the subsidiary to have a negative influence on knowledge inflows. The result suggests how MNC subsidiaries can build a capability for effective knowledge integration in an efficient and competitive way.

The contribution of this paper is to highlight the utility and limits of RBV at the level of the foreign subsidiary in explaining knowledge integration in the MNC. The paper also raises a number of managerial implications, including the question of how informal organizational capital and employee involvement may be influenced by local subsidiary managers, as well as by regional and headquarters managers.

2. RESOURCE-BASED THEORY AND MNC KNOWLEDGE INTEGRATION

The resource-based view (RBV) posits that sustainable competitive advantage may be achieved by developing internal resources that are rare, valuable, hard to imitate and non-substitutable (Barney, 1991; Barney, 1995; Barney et al., 2001; Wernerfelt, 1984). This view has an important application in understanding knowledge transfer, as it emphasizes differences between individuals (including those employed in different subsidiaries) as a determinant of organizational success (Barney et al., 2001; Alvarez and Busenitz, 2001). RBV is important for understanding knowledge transfer because of its emphasis on the role of internal resources and capabilities in facilitating flows of knowledge (Barney, 1995). Indeed, the knowledge-based view of the firm (Kogut, 2000; Kogut and Zander, 1992), an important extension of RBV, focuses attention on the characteristics of knowledge and the process of its coordination as heterogeneous internal firm resources. This puts a focus on how resources and capabilities develop over time (Barney, 2001), stressing how knowledge and its coordination may evolve as heterogeneous internal resources that act as sources of competitive advantage (Argote and Ingram, 2000; Barney, 2001).

The knowledge-based view treats the firm as a social community in which knowledge is stored and transferred more efficiently on an internal basis than through the external market (Kogut, 2000; Kogut and Zander, 1992). The stock of knowledge developed by a firm may act as its principal source of competitive advantage and the efficiency by which firm

knowledge is created and transferred internally can determine the success of the firm vis-à-vis competitors (Gupta and Govindarajan, 1991, 2000; Kogut, 2000; Kogut and Zander, 1992; Kostova, 1999). For an MNC, knowledge is distributed internationally amongst a network of dispersed subsidiary units. A growing body of literature has emerged examining the antecedents and consequences of knowledge creation and transfer within such networks (e.g., Jensen and Szulanski, 2004; Minbaeva et al., 2003; Persson, 2006). This literature has emphasized how knowledge transfer relates not only to the sending of knowledge from a source to a recipient unit, but also its integration, understanding and application (Cohen and Levinthal, 1990; Hansen, 1999; Szulanski, 1996).

Knowledge is a complex concept for which researchers have provided various definitions and typologies over the years. Foremost amongst these is the distinguishing between articulated (or codified) and tacit (difficult to express, gained through experience) knowledge (Hansen, 1999; Lagerström and Andersson, 2003; Lane and Lubatkin, 1998). Others differentiated knowledge by type, such as information and know how (Kogut and Zander, 1992) and "procedural" (know-how, such as product designs) and "declarative" (operational data, such as monthly financials) (Gupta and Govindarajan, 2000). Birkinshaw, Nobel, & Ridderstråle (2002) described firm level knowledge in terms of information (such as firm patents) and know-how (such as organizational routines) types. Thus we have two fundamental knowledge types: procedural know-how and declarative information, the former being difficult to articulate and to transfer to recipients and the latter being codifiable and less difficult to transfer.

Szulanski (1996) described knowledge transfer as the "exchange of organizational knowledge between a source and a recipient" (Szulanski, 1996: 28) and identified four stages of knowledge transfer: initiation, implementation, ramp-up, and integration. The initiation and implementation stages comprise antecedents leading to a transfer decision and actual

knowledge flow to a recipient. Ramp-up and integration relate to knowledge modification and exploitation. Similarly, Davenport and Prusak (1998) defined transfer as "Transmission + Absorption (and Use)". Hansen (1999) also referred to knowledge transfer as "(moving and incorporating) knowledge across organization subunits" (Hansen, 1999: 83). In this view, knowledge has not been transferred unless it has been absorbed. The common notion in these definitions of knowledge transfer is that successful transfer has taken place once the knowledge is utilized by the recipient.

From the RBV perspective, various forms of capital may influence knowledge transfer within a firm. These include human, social and organizational capital (Morris et al., 2006). In his seminal work, Schultz (1961) discussed human capital in terms of knowledge and skills of human individuals within an economic system, such knowledge and skills being a consequence of investment in education, training, even migration of people. Schultz (1961) emphasized the qualitative aspects of human capital, arguing that: "quality components as skill, knowledge, and similar attributes…affect human capabilities to do productive work" (Schultz, 1961: 8). Scholars have recently shown how human capital within the firm is vital to the performance of the firm (Hitt, Bierman, Shimizu, & Kochhar, 2001). In this sense, human capital is an intangible resource that can directly impact the effectiveness of firm strategy. Lepak and Snell (1999) described human capital in terms of two principal characteristics: value and uniqueness. Value refers to the degree to which employees of the firm contribute towards competitive advantage of the firm, and uniqueness the degree to which those employees are specific to the firm.

By contrast, social capital refers to the quality of social relationships between people and the degree to which these relationships act as a source of knowledge and opportunity (Burt, 1997; Nahapiet and Ghoshal, 1998). According to Burt (1997): "while human capital is surely necessary to success, it is useless without the social capital of opportunities in which to

apply it" (Burt, 1997: 339). In this respect, social capital is a "contextual complement to human capital" (Burt, 2000: 347). Important in this view is that social structure can create a competitive advantage for individuals and groups of individuals within organizations. Social capital has been divided into three dimensions: structural, relational and cognitive (Tsai and Ghoshal, 1998). Social interaction and trust have been empirically demonstrated as having a positive effect on resource exchanges across units of international firms, and thence on product innovation (Tsai and Ghoshal, 1998). Kostova and Roth (2002) showed how the internal relational context of the MNC is an important factor in practice transfer and adoption by subsidiaries. Levin and Cross (2004) demonstrated the importance of relational trust (both weak and strong ties) in effective knowledge transfer. These authors highlighted the importance of controlling for different forms of trust for understanding useful knowledge receipt. Social capital is also important in firms as it enables firms to create new intellectual capital (Nahapiet and Ghoshal, 1998).

In contrast to human and social capital, various scholars have also pointed to organizational capital as a potentially heterogeneous source of effective knowledge transfer and advantage for firms. Organizational capital refers to aspects of internal organization, including intra-firm behaviour and modes of control, that serve to support the functioning of the firm (Acs and Fitzroy, 1989). Some have argued that organizational capital refers to the firm's set of productive information; an asset that determines the limits of what a firm can do (Prescott and Visscher, 1980). Others see organizational capital as an important factor that affects employee "citizenship efforts", involving investment in improvement to productivity and worker well-being (Tomer, 1998). Thus we can conceptualize organizational capital as being a firm-specific good embodied in both the organization of production and the relationship of employees to tasks (Atkeson and Kehoe, 2005). To illustrate this, Acs and Fitzroy (1989) compared analysis of Western, formalized (Taylorist) approaches with more

decentralized, participative approaches of Japanese firms that emerged in the 1970s and 1980s. In terms of organizational capital, the latter emphasized flexibility and cooperation of the workforce, while the former held hierarchical control and low-trust mechanisms of control as central organizational tenets.

3. THE ROLE OF SUBSIDIARY CAPITAL IN MNC KNOWLEDGE INTEGRATION

We can apply this concept of organizations being comprised of various forms of capital to the overseas subsidiary of the MNC. In an MNC setting, where subsidiaries are spread across continents, languages and national cultures, knowledge transfer becomes a complicated task (Lagerström and Andersson, 2003). Moreover, some MNCs create fierce competition between their subsidiaries, resulting in barriers to resource and knowledge sharing. Removing these barriers and increasing knowledge flow should thus be posited on a cooperative and interactive internal environment. We hypothesize that the various forms of capital (human, social, organizational) within the subsidiary impact knowledge transfer into and out of the subsidiary.

3.1 Human Capital

Prior research has shown that human capital within a subsidiary organization is likely to facilitate knowledge flows because levels of knowledge held by the subsidiary employees determine the degree to which they are able to internalize and integrate transferred knowledge. Minbaeva et al. (2003) showed how absorptive capacity, the "ability to recognize the value of new, external knowledge, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990: 128), is facilitated by prior knowledge and intensity of effort (Minbaeva et al., 2003) residing within an overseas subsidiary of the MNC. In other words, human capital within the subsidiary is important to knowledge transfers involving the subsidiary.

Subsidiary employees' ability to recognize the value of knowledge and to assimilate and apply it relies heavily on educational background and job related skills, i.e., the level of human capital within the subsidiary (Minbaeva et al., 2003: 589).

Similarly, one might expect levels of skills and expertise within a subsidiary to be associated with knowledge outflows from the subsidiary. A principal reason for this is the actual need for the subsidiary's knowledge by other parts of the MNC. Some of the most important types of subsidiaries in terms of human capital are Centres of Excellence (CoEs), highly developed in a specialized area and providing important knowledge to the rest of the MNC (Frost et al., 2002). Specialized subsidiaries, such as those in R&D, also foster their own evolution and development by sharing knowledge with other parts of the MNC (Asakawa, 2001; Frost et al., 2002). Birkinshaw (1996) demonstrated how an effective global mandate is based on distinctive capabilities possessed by the subsidiary. Bartlett and Ghoshal's (1989) depicted certain subsidiaries as strategic leaders within the MNC, generating new knowledge for the MNC not only because of the importance of the host country in which they reside, but also because of their human capital. Hence,

Hypothesis 1. The more competitive the local workforce in an overseas subsidiary, the greater the knowledge integration of the subsidiary.

3.2 Social Capital

Lengnick-Hall and Lengnick-Hall (2006) defined social capital in an international context as: "the intangible resource of structural connections, interpersonal interactions and cognitive understanding that enables a firm to (a) capitalize on diversity and (b) reconcile differences" (Lengnick-Hall and Lengnick-Hall, 2006: 477). Socialization mechanisms within MNCs can "build inter-personal familiarity, personal affinity, and convergence in

cognitive maps among personnel from different subsidiaries" (Gupta and Govindarajan, 2000: 479). As Ghoshal, Korine, & Szulanski (1994) noted: "lateral interpersonal networking is considered to be one of the most important elements in managing information flows within MNCs" (Ghoshal, Korine, & Szulanski, 1994: 101). In a similar vein, Gupta, Govindarajan, & Malhotra, (1999) stated: "corporate socialization has been recognized as an important mechanism by which subsidiary managers' values and interests can become closely aligned with those of the parent corporation" (Gupta, Govindarajan, & Malhotra, 1999: 211). This supports goal sharing and willingness to share knowledge with other units (Björkman et al., 2004; Gupta and Govindarajan, 2000). As noted by Hansen (1999) "efficient knowledge sharing is typically characterized by tight coupling between people from different organization subunits" (Hansen, 1999: 82). Hence,

Hypothesis 2. The better connected the workforce of an overseas subsidiary with other MNC units, the greater the knowledge integration of the subsidiary.

3.3 Organizational Capital

Organizational capital may refer to formalized procedures that constitute an articulation and codification of organizational knowledge regarding how to apply resources productively, as well as mechanisms to promote high commitment in employees. Firstly, formalized organizational capital within the overseas subsidiary may contribute to the ability of the subsidiary to become integrated within the knowledge network of the MNC. In this sense, organizational capital refers to the "institutionalized knowledge and codified experiences" residing within a subsidiary (Youndt, Subramaniam and Snell, 2004; Morris et al., 2006). Such knowledge is relatively easily communicated (Lane and Lubatkin, 1998) and has a high level of codification (Hansen, 1999). The subsidiary's HRM function may use

codified procedures, systems and databases to reduce inefficiency in the implementation of HR practice (Morris et al., 2006). Such practices are aimed at seeking "to encourage the continuous development of employees' skills and abilities, their motivation and the effective utilization of their labour through progressive and adaptive workplace operations" (Barton and Delbridge, 2004: 333).

The formalization of HRM practices is not limited to a single aspect of HR management (Laursen and Foss, 2003, Barton and Delbridge, 2004). Guest (1997) suggested that formally designed HRM practices apply in areas such as selection, training, appraisal, rewards, and job design. Well-designed recruitment procedures can act as a front line instrument to be used by an overseas subsidiary in an MNC, helping ensure the elimination of unsuitable candidates and the hiring of suitably-qualified ones. This also builds commitment by signalling to successful applicants the seriousness of the hiring activity and the importance of the applicant's prior knowledge and experience (Pfeffer, 1998: 69-74). This acts as a way of maintaining stocks of related prior knowledge in a subsidiary. Through rigorous selection procedures, educational and training histories can be vetted and job-related skills assessed.

Similarly, performance evaluation and training programmes can remove barriers to knowledge transfer. Having an explicit item for knowledge transfer as part of the performance evaluation framework for subsidiary employees can encourage subsidiary employees to share and receive knowledge from other units of the MNC. Providing extensive training programs for employees to improve job-related skills can also ensure that the local organization has higher absorptive ability (Minbaeva et al., 2003; Pfeffer, 1998: 85-90).

Secondly, scholars advocating progressive HRM practices emphasize the importance of high commitment work practices (Delaney and Huselid, 1996; Barton and Delbridge, 2004; Pfeffer, 1998; Riordan et al., 2005). The principal argument is that high commitment approaches provide a number of sources of high performance, including encouraging people

to work harder and smarter, and saving overhead (Pfeffer, 1998: 33). Such programs encourage employees to use their initiative to improve work structures and procedures, and allow decisions to be made at a lower, more decentralised, level (Pfeffer, 1998: 74-79). With this type of arrangement in the MNC, subsidiary employees require appropriate knowledge to make the decisions, and are willing to share knowledge regarding their initiative and ideas for improvements.

Pfeffer (1998) also stresses corporate information sharing and reducing status distinctions (barriers include dress, language, office arrangements and wage differences across levels) as informal practices that encourage commitment in employees. Information sharing regarding corporate performance and strategy allows employees to become aware of the overall vision, goal, strategy and performance (Pfeffer, 1998: 93-96). Employees receive a clearer picture of the firm's business situation and reasons for any change in strategy. Employees of a subsidiary in the MNC are more likely to cooperate with changes in corporate strategy when they perceive they have been given a full set of facts and a clear justification and rationale behind new decisions. Similarly, by reducing status distinctions, barriers between potential participants in a knowledge exchange can be removed and participants can be brought closer together: there exists a mutual perception of equality and equity (Pfeffer, 1998: 90-93). In an MNC, reducing status distinctions can help to remove the possibility of cognitive barriers and encourage dispersed employees to share and accept knowledge freely and effectively with each other.

Decentralization of decision rights within the subsidiary, sharing of corporate information and reducing status distinctions all contribute to an informal organizational capital within the subsidiary. This participative approach encourages an open climate for knowledge creation and development. According to management control theory (Eisenhardt, 1985; Merchant and Van der Stede, 2003), benefits of decentralization to lower level staff

include motivation for employees, more effective use of local knowledge, and less overhead for senior managers. Since motivation can be prime antecedent of knowledge transfer within the MNC (Gupta and Govindarajan, 2000; Minbaeva et al., 2003) we may expect employee participation approaches within the overseas subsidiary to stimulate knowledge inflows and outflows at the level of the subsidiary. Hence,

Hypothesis 3. The greater the use of practices for encouraging employee commitment within an overseas subsidiary, the greater the knowledge integration of the subsidiary.

These hypotheses are shown as a simple model in Figure 1.

Insert Figure 1 about here
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4. METHODOLOGY

4.1 Data Collection

We tested this model through a questionnaire survey of senior subsidiary managers in fully-owned subsidiaries of Korean MNCs located in the United Kingdom, France and Germany. These three host countries were chosen because they are major locations of outward investment by Korean MNCs to Europe and also because they represent different cultures, management styles and national institutions. Previous research on knowledge transfer has focused mainly on MNCs headquartered in western countries (Gupta and Govindarajan, 1999, Minbaeva et al., 2003, Schulz, 2003, Björkman et al., 2004, Almeida and Phene, 2004, Feinberg and Gupta, 2004). There has been little research on knowledge integration amongst subsidiaries of Asian MNCs, despite evidence that collecting market

information and proximity to customers are principal motives for Asian MNC investment in western markets (e.g., Poon, Hsu, & Jeongwook, 2006).

We identified 227 subsidiaries or branch offices of Korean MNCs located in the UK, Germany and France. These were identified from the directories of the Korean Chamber of Commerce in each of the three countries. Among these, 68 were identified as small sales subsidiaries of SMEs and deemed inadequate for our study. Thus, the sample frame was reduced to 159 subsidiaries. The questionnaire was targeted at an experienced senior manager in the subsidiary, as we required the respondent to possess knowledge of human, social and organizational capital in the subsidiary. The questionnaires were sent by email with a personalized cover letter explaining the purpose of the survey and to assure the recipients of confidentiality. A total of 159 questionnaires were issued and after the first week another email was sent to non-respondents, with a telephone follow-up after a 2 week interval. In this round we received 74 usable returns. In order to conduct inter-rater reliability tests we elicited a further 21 returns representing 11 subsidiaries in the initial sample frame that did not respond to the first mailing (results of inter-rater reliability tests are reported below). The final sample of 86 subsidiaries represented various industries with a large proportion in electronics, IT and telecommunications, reflecting the competitiveness of Korean firms in these industries. We received 41 responses (66.1%) from the United Kingdom, 18 responses (42.9%) from France and 27 responses (49.1%) from Germany. The overall response rate was 54.1% (Table 1).

Insert Table 1 about here

In terms of characteristics of respondents, we note the following. Firstly, 67 respondents (77.9%) were Korean expatriates. Secondly, 73 respondents (84.9%) had had work experience within the headquarters or other subsidiaries of their MNC. Thirdly, the vast

majority were male (n=79, 91.9%). Finally, the mean tenure of the respondent in the subsidiary was 3.01 years (s.d. 2.11 years). In terms of job function, 29 of the respondents (33.7%) were HR managers, 31 (36.0%) reported their role as general manager / managing director / deputy general manager or director. The remainder reported their role as finance manager / research manager / sales and marketing director / administration manager and the like. Overall, this profile gave us confidence that the respondents had the experience to be able to assess aspects of human, social and organizational capital within the subsidiary, as well as knowledge inflows and outflows to and from the subsidiary.

4.2 Measures

Dependent variables. We used two dependant variables to indicate knowledge integration: *knowledge inflow* to a focal subsidiary and *knowledge outflow* from the subsidiary. Knowledge inflow was defined as the usefulness of knowledge transferred from other MNC units to the focal subsidiary (Davenport and Prusak, 1998; Szulanski, 1996). This approach has been used widely in studies of knowledge transfer within MNCs (Gupta and Govindarajan, 2000; Minbaeva et al., 2003; Björkman et al., 2004). Respondents were asked to rate the usefulness of different types of know-how from other MNC units, including marketing, product and management know-how. The questions used a five-point Likert scale, where 1 indicated "not at all useful" to 5 indicated "very useful". Similarly, knowledge outflow was defined as the usefulness of knowledge transferred from the focal subsidiary to other MNC units. Respondents were asked to rate the usefulness of their own know-how to other MNC units. Again, marketing, product and management know-how types were used.

Independent variables. There were three independent variables. A scale for *subsidiary human capital* was built from three items capturing the respondent's assessment of employees' overall ability in the subsidiary, the level of their job related skills, and their

educational level (Minbaeva et al., 2003). All of these were operationalized in terms of relative to local competitors and captured on a five point scale (centred) ($\alpha = 0.86$). The assessment relative to local competitors is important because of the emphasis on human capital as an indicator of workforce competence in the local labour market. A scale for *subsidiary social capital* was built from four items relating to structural and interpersonal interactions through which subsidiary employees socialize with other units of the MNC (Lengnick-Hall and Lengnick-Hall, 2006; Morris et al., 2006). We included the frequency of using e-mail, participation in joint workshops, frequency of use of conference calls, and participation in corporate-wide committees ($\alpha = 0.72$). A formative scale for *subsidiary organizational capital* was built from seven items representing high performance HRM practices. Four of these items reflected the use of HR procedures (Morris et al., 2006). We used procedures for recruitment, the use of job-related training programmes for current employees, employee performance evaluation procedures and performance-related incentives (Guest, 1997). Three further items captured the degree to which employees were encouraged to participate in organizational activity through empowerment and informal control mechanisms (Batt, 2002; Riordan et al, 2005). Here we used the degree to which status distinctions were minimized, the extent to which subsidiary employees were informed about company performance, and the degree of autonomy given to subsidiary employees (Pfeffer, 1998; Riordan et al, 2005). Table 2 shows the scale construction.

Insert Table 2 about here

We ran a factor analysis to understand the psychometric properties of the reflective scales (knowledge inflows, knowledge outflows, human capital and social capital). Table 3 shows the results of a rotated solution using Varimax rotation. We note that all knowledge integration items (inflows and outflows) loading on a single component, the human capital

items loading a distinct component, and the social capital items also loading on a distinct component. This provides support for our scale construction and data reduction.

Insert Table 3 about here

Control variables. We incorporated five control variables into our empirical analysis. First, we controlled for the size of the subsidiary in terms of number of employees (we used the natural log of the number of employees). Subsidiary size may explain communication frequency and knowledge flows through innovation scale effects (Frost, 2001). Second, we controlled for the age of the subsidiary (in years, using natural log). Frost and Zhou (2005), in an investigation into reverse knowledge transfer in the pharmaceutical and automotive industries, showed how "older subsidiaries are more likely to act as the source of knowledge utilized by headquarters organizations" (Frost and Zhou, 2005: 684-685). Both size and age were self-reported. The third and fourth control variables controlled for the host country of the subsidiary. Variations in national cultures and institutional environments have the propensity to explain differences in managerial behaviour, including participation in knowledge in- and outflows to / from other units of the MNC. We used dichotomous control variables for the French and German subsidiaries (i.e., UK as the base case).The final control variable was used to incorporate any impact on knowledge flows caused by the level of dynamism in the industry of the MNC. Knowledge flows are vital in high-velocity industries where firms face being left behind if they are unable to replenish knowledge stocks (Brown and Eisenhardt, 1997). We used a dichotomous variable for this (1 = electronics, informational technology, pharmaceuticals, chemicals ; 0 = automobiles, shipping, logistics, energy). Descriptive statistics for all variables are shown in Table 4. All variables are normally distributed.

Insert Table 4 about here

4.3 Data Quality and Analysis

Analysis was performed as follows. Firstly, given the potential for common method variance through the self-reported questionnaire (Podsakoff and Organ, 1986), we ran a Harmon's single factor test (Podsakoff and Organ, 1986) to check if items loaded significantly on one factor. This revealed five factors with eigenvalues ranging from 1.063 to 9.011, with the first factor less than 50% of the total variance. Secondly, inter-correlations between the independent variables were examined to assess potential multi-colinearity problems. We also examined variance inflation factors in subsequent regression models (reported below). Thirdly, we ran inter-rater reliability tests on five of the subsidiaries where we received additional survey responses. These additional responses were not included in the estimation models. Using the within-group technique for each scale (James et al., 1984) we note that the median r_{wg} ranges between 0.89 and 0.92, providing strong support for agreement between raters within the same subsidiary. Fourthly, we checked for the possibility of respondent bias by examining differences between the following: early vs. late respondents, expatriate vs. non-expatriate respondents, and tenure (greater and less than 2 years). There were no statistically significant differences on any of our variables of interest. Finally, multiple regression models for testing the hypotheses were run. Two models were tested: one with knowledge inflows as the dependent variable, and one with knowledge outflows as the dependent variable. In each case, the effects of the control variables were also assessed. In addition to running single dependent variable models, we also ran a two equation system using seemingly unrelated regression (SUR) analysis (Zellner, 1962). This additional analysis accounted for potential correlation of error terms between the equations for knowledge inflows and knowledge outflows and enabled us to inspect any differential effects

by treating the two dimensions of knowledge integration separately. We ran this twice: once for control variables and once for the full model. The Breusch-Pagan test of independence indicated a dependence between the residuals for the full model (χ^2=37.35, p=0.000).

5. FINDINGS

Table 5 shows the correlation matrix. We observe positive and significant correlations between the independent variables (0.28 – 0.51), suggesting that multi-colinearity will not effect our interpretation of the results. We also note positive correlations between the dependent variables and the main independent variables, providing some initial support to our core argument that effective knowledge transfer is related to various forms of capital at the level of the subsidiary.

Insert Table 5 about here

Table 6 shows the OLS regression results. As far as the control variables are concerned, we see that subsidiary size has a positive influence on knowledge inflows (Model 1, full model) ($p<0.05$) and the French subsidiaries are associated with knowledge outflows (Model 2, full model) ($p<0.05$). We also note the negative impact of knowledge intensive industries on knowledge inflows to the subsidiary ($p<0.1$). In terms of the hypothesized predictors, we see (1) that human capital has a negative a knowledge inflows ($p<0.05$) but no significant effect on knowledge outflows; (2) that social capital has a positive impact on knowledge outflows ($p<0.05$) and a marginal effect on knowledge inflows; and (3) that organizational capital has a strong, positive impact on both knowledge inflows and outflows ($p<0.001$). Table 7 shows the results of the multiple equation SUR analysis. This result supports the results of the OLS regression. Thus we find no support for *H1*, partial support for *H2* and full support for *H3*. Variance inflation factors are all < 2, i.e., at an acceptable

level (Hair, Anderson, Tatham, & Black, 1998) and we do not consider multi-colinearity to affect our interpretation of the results.

Insert Table 6 about here

Insert Table 7 about here
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6. DISCUSSION

The present analysis demonstrates how different forms of capital within an overseas subsidiary influence the knowledge integration of the subsidiary. By knowledge integration, we mean the degree to which useful knowledge for different business functions flows into *and* out of the focal subsidiary. We build on the explanatory power of the capital framework (Morris et al., 2006) by conducting an empirical test amongst subsidiaries of Korean MNCs in Europe. The framework is particularly important for latecomer Asian MNCs, such as those from Korea, as collecting market information and proximity to customers are principal motives for their investment in western markets (e.g., Poon, Hsu, & Jeongwook, 2006). The results indicate that organizational capital within the subsidiary (operationalized as HRM procedures and local encouragement for employee participation through decentralization, sharing of corporate information and reduction in status distinctions) has the strongest impact on subsidiary knowledge integration. The findings illustrate that different forms of capital within the subsidiary have different influences on knowledge transfer involving the subsidiary. This suggests that RBV (Barney, 1991; Barney, 1995; Barney et al., 2001; Wernerfelt, 1984) has both utility and limits when applied to knowledge integration of overseas subsidiaries of MNCs. By considering different types of capital within the same study, we are able to draw attention to those that matter most to knowledge integration. By

considering both in- and outflows, we are also able to show differences in the influence of different forms of capital on the subsidiary as consumer and provider of MNC knowledge.

Where RBV is most relevant to subsidiary knowledge integration is in organizational capital: organizing employees in overseas subsidiaries through well design procedures such that they are empowered locally to serve organization needs through allocation of decision rights and building a local climate of trust. Where RBV is less relevant to subsidiary knowledge integration is in the role of human and social capital.

The results for human and social capital are rather surprising. However, there are some reasonable explanations for our results. Firstly, where a subsidiary has a high degree of human capital, and, more specifically, a local workforce that is better trained and more capable than local competitors, the need for knowledge from the MNC headquarters or other units of the MNC is likely to be less. The highly competitive local workforce is, in this situation, performing well, and local managers may reject or resent knowledge from other units to be received and *used* within the subsidiary. In this sense the subsidiary risks becoming standalone or isolated, albeit high performing at a local level. Headquarters managers may tolerate this situation because of the performance of the subsidiary, and particularly so if the subsidiary is engaged in localization and adaptation of products and services for the local market. This may also explain our finding for knowledge outflows under conditions of high human capital in the subsidiary. Secondly, our findings suggest that, where employees of an overseas subsidiary enjoy high social connectivity with employees in other units of the MNC, we should not necessarily expect knowledge to flow into and out of the subsidiary in a uniform way. In this sense, the argument that social connectivity can also constrain organizational effectiveness applies (Portes, 1998; Lengnick-Hall and Lengnick-Hall, 2006). This relies on in-group – out-group dynamics arguments; while some subsidiary employees are well socially-connected within the MNC, others may be less so. This is

especially relevant given the conceptualization of a social network as a private, as well as a public good (Kostova and Roth, 2002). The out-group, if left out of the social interactions that led to the opportunity for knowledge flows, may be less likely to internalize and apply new knowledge from other units of the MNC (inflows) or provide new knowledge to other units of the MNC (outflows). Another reason is that too much time spent in social interactions with other units of the MNC may come at a cost: not enough time to actually share new knowledge with other employees of the subsidiary, and not enough time to see new knowledge applied.

The results of this study suggest that subsidiary managers need to pay particular attention to organizational capital within the subsidiary if they want to integrate the subsidiary within the internal MNC network. This requires a local philosophy of high commitment HRM practices and devolvement of decision-making to lower levels within the subsidiary. In particular, reducing status distinctions and sharing corporate knowledge act to motivate employees to apply external knowledge in productive ways, as well as offer their knowledge to other units of the MNC. Creating involvement *within* the subsidiary ultimately results in the involvement *of* the subsidiary within the MNC. For headquarters managers wishing to create a network of well-integrated subsidiaries, or even to make specific subsidiaries better integrated in terms of knowledge in- and outflows, our results suggest two implications. Firstly, headquarters managers should be cognizant of the potentially detrimental affect of subsidiary human capital on knowledge inflows. If headquarters managers sense that key knowledge is not flowing into – and being used by – a particular subsidiary, the reason may lie in the skill level and competitiveness of the local workforce. Extra efforts may then be taken to understand whether the knowledge is actually required and to work collaboratively with subsidiary managers to assess the need for knowledge flows. Secondly, headquarters managers may encourage the development of informal organizational

capital within a subsidiary (or group of subsidiaries). Global HR functions can provide guidelines to subsidiary managers for empowering the local workforce and encouraging a high commitment locally. In this vein, headquarters managers can ensure that subsidiaries themselves receive autonomy where appropriate, and that a corporate culture is developed in which status distinctions are reduced and access to corporate information is made possible for all employees.

Despite these implications for theory and practice, the current study has a number of limitations that should be addressed in future work. Firstly, our operationalization of human, social and organizational capital relied on a limited number indicators captured through a questionnaire. A wider range of items could have been used for social capital, to tap into relational aspects such as trust, and cognitive dimensions (Kostova and Roth, 2002). Secondly, financial capital and the financial performance of the subsidiary and MNC were not accounted for, and this may possibly be a reason for useful knowledge in and outflows of subsidiaries. Thirdly, our sample design and size prevents generalization to a wider range of MNCs and subsidiaries. Future work should address these limitations and further develop the concept of subsidiary capital and its influence on knowledge integration within the MNC. As Minbaeva (2005) points out: "HRM practices and knowledge-related outcomes are associated, but their link still misses some important aspects of the interpretation and empirical support" (Minbaeva, 2005: 126). Future research should develop understanding of various types of subsidiary capital, particularly the organizational capital that captures HRM practice, and determine how they impact knowledge flows and the long-term performance of both subsidiary and MNC. This will ultimately have additional implications for resource-based theory and for managers in practice.

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TABLES AND FIGURES

Table 1. Sample and response rate

	Subsidiaries targeted	Usable returns	Response rate (within country)
United Kingdom	62	41	66.1%
France	42	18	42.9%
Germany	55	27	49.1%
Total	159	86	54.1%

Table 2. Scale construction

Questionnaire items (5 point)	Cronbach's Alpha
Knowledge inflows (4 items)	0.87
1. To what extent does knowledge from your headquarters and other subsidiaries flow into your subsidiary?	
2. Do you find the marketing know-how from your headquarters and other subsidiaries useful?	
3. Do you find the product know-how from your headquarters and other subsidiaries useful?	
4. Do you find the management practices from your headquarters and other subsidiaries useful?	
Anchors: 1 = not at all, 5 = very much	
Knowledge outflows (4 items)	0.87
1. To what extent does knowledge from your subsidiary flow into your headquarters and other subsidiaries?	
2. Has your own marketing know-how been used by your headquarters and other subsidiaries?	
3. Has your own product know-how been used by your headquarters and other subsidiaries?	
4. Has your own management practice been used by your headquarters and other subsidiaries?	
Anchors: 1 = not at all, 5 = very much	

Questionnaire items (5 point)	Cronbach's Alpha
Subsidiary human capital (3 items)	0.86
1. Compared to your local competitors, the employees' overall ability in this subsidiary are…	
2. Compared to your local competitors, the employees' job-related skills in this subsidiary are…	
3. Compared to your local competitors, the employees' educational level in this subsidiary are…	
Anchors: 1 = far below average, 5 = far above average	
Subsidiary social capital (4 items)	0.73
1. Employees in this subsidiary frequently use email to communicate with other unit members.	
2. Employees in this subsidiary frequently join workshops with other unit members.	
3. Employees in this subsidiary frequently use conference calls with other unit members.	
4. Employees in this subsidiary frequently join corporation wide committees.	
Anchors: 1 = strongly disagree, 5 = strongly agree	
Subsidiary organizational capital (7 items)	Formative
1. This subsidiary has well designed recruitment procedures.	construct
2. This subsidiary has well designed employee performance evaluation procedures.	
3. This subsidiary has a well designed performance-related incentive program.	
4. This subsidiary has extensive job-related training programmes for current employees.	
5. The status distinction between managers and employees is not high in this subsidiary.	
6. Employees in this subsidiary are well informed about company's performance.	
7. Decision making in this subsidiary is highly decentralized.	
Anchors: 1 = strongly disagree, 5 = strongly agree	

Table 3. Factor analysis

Questionnaire Item	Component 1: Knowledge integration	Component 2: Subsidiary human capital	Component 3: Subsidiary social capital
To what extent does knowledge from your headquarters and other subsidiaries flow into your subsidiary?	0.771		
Do you find the marketing know-how from your headquarters and other subsidiaries useful?	0.798		
Do you find the product know-how from your headquarters and other subsidiaries useful?	0.922		
Do you find the management practices from your headquarters and other subsidiaries useful?	0.772		
To what extent does knowledge from your subsidiary flow into your headquarters and other subsidiaries?	0.744		
Has your own marketing know-how been used by your headquarters and other subsidiaries?	0.665		
Has your own product know-how been used by your headquarters and other subsidiaries?	0.679		
Has your own management practice been used by your headquarters and other subsidiaries?	0.690		
Compared to your local competitors, the employees' overall ability in this subsidiary are…		0.905	
Compared to your local competitors, the employees' job-related skills in this subsidiary are…		0.861	
Compared to your local competitors, the employees' educational level in this subsidiary are…		0.815	
Employees in this subsidiary frequently use email to communicate with other unit members.			0.647
Employees in this subsidiary frequently join workshops with other unit members.			0.704
Employees in this subsidiary frequently use conference calls with other unit members.			0.848
Employees in this subsidiary frequently join corporation wide committees.			0.657

Table 4. Descriptive information

	Theoretical range	Mean	Standard deviation
Knowledge inflows	1-5	3.55	0.87
Knowledge outflows	1-5	3.41	0.89
Human Capital	1-5	3.58	0.80
Social Capital	1-5	2.91	0.89
Organizational Capital	1-5	3.36	0.67
Ln (sub employees)	-	3.55	1.16
Ln (sub age)	-	2.35	0.86
UK dummy	0/1	0.48	0.50
France dummy	0/1	0.21	0.41
Germany dummy	0/1	0.31	0.47
Knowledge intensive industry	0/1	0.41	0.49

Table 5. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
Knowledge inflows 1											
Knowledge outflows 2	0.74***										
Human capital 3	0.15	0.47***									
Social capital 4	0.32**	0.46***	0.28**								
Organizational capital 5	0.59***	0.67***	0.51***	0.30**							
Ln (sub employees) 6	0.31**	0..06	-0.11	0.08	0.16						
Ln (sub age) 7	0.02	-0.02	-0.16	-0.01	0.06	0.09					
UK dummy 8	-0.24**	-0.29**	-0.08	-0.16	-0.2+	-0.14	0.04				
France dummy 9	0.05	0.19+	-0.05	0.10	0.07	-0.06	0.03	-0.49***			
Germany dummy 10	0.22*	0.15	0.13	0.09	0.15	0.21+	0.01	-0.65***	-0.35***		
Knowledge intensive industry 11	-0.12	-0.13	-0.18	-0.17	-0.05	0.20	-0.12	-0.08	0.04	0.05	

+p<0.1 *p<0.05 **p<0.01 ***p<0.001

Table 6. OLS regression results

	Hypothesis	Model 1 Knowledge inflow		Model 2 Knowledge outflow	
Control Variables					
Ln (sub employees)		0.31**	0.19*	0.06	-0.02
Ln (sub age)		-0.04	-0.09	-0.06	-0.04
France dummy		0.14	0.04	0.28**	0.17*
Germany dummy		0.21+	0.13	0.24**	0.10
Knowledge intensive industry		-0.21*	-0.16+	-0.18	-0.05
Independent Variables					
Human Capital	*H1*: +ve		-0.25*		0.12
Social Capital	*H2*: +ve		0.15 (p=0.11)		0.24**
Organizational Capital	*H3*: +ve		0.61***		0.51***
Maximum VIF		1.18	1.57	1.18	1.57
F		3.21*	8.59***	2.02+	12.33***
Adj. R-Square		0.12	0.42	0.06	0.57
N		86	86	86	86

+p<0.1 *p<0.05 **p<0.01 ***p<0.001

Table 7. Results of Seemingly Unrelated Regression (SUR) (beta coefficients with robust standard errors)

	Hypothesis	Knowledge inflow		Knowledge outflow	
Control Variables		Control model	Full model	Control model	Full model
Ln (sub employees)		0.22 (0.08)**	0.14 (0.06)*	0.04 (0.08)	-0.01 (0.06)
Ln (sub age)		-0.04 (0.10)	-0.09 (0.08)	-0.06 (0.11)	-0.04 (0.08)
France dummy		0.30 (0.22)	0.08 (0.18)	0.60 (0.24)*	0.37 (0.17)*
Germany dummy		0.39 (0.20)*	0.24 (0.16)	0.45 (0.21)*	0.20 (0.15)
Knowledge intensive industry		-0.36 (0.18)*	-0.28 (0.15)+	-0.31 (0.19)	-0.08 (0.14)
Independent Variables					
Human Capital	*H1*: +ve		-0.27 (0.11)*		0.14 (0.10)
Social Capital	*H2*: +ve		0.14 (0.08)+		0.24 (0.08)**
Organizational Capital	*H3*: +ve		0.80 (0.13)***		0.69 (0.12)***
Breusch-Pagan test		46.76***	37.35***	46.76***	37.35***
Chi-squared		17.29**	76.82***	10.89+	110.35***
R-Square		0.17	0.47	0.11	0.59
N		86	86	86	86

+p<0.1 *p<0.05 **p<0.01 ***p<0.001

Figure 1. Subsidiary capital and knowledge integration