Headquarter allocation of resources to intra-MNE transfer projects

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ABSTRACT

This paper examines headquarter allocation of resources to specific innovation transfer projects intra-MNE between sending and receiving subsidiaries. It is assumed that resources in the MNE are limited and that headquarters is the principal actor in leveraging these resources inside the organization between competing innovation transfer projects. More specifically, building on the resource based view this paper deals with non-financial resources allocated from headquarters to specific intra-MNE innovation transfer projects. Hence, this study adds to theories about how to gain attention in the MNE and subsidiary evolution. Findings from a data set of 169 transfer projects reveals that headquarters tend to favor established lines of businesses, as opposed to overall subsidiary relatedness for additional corporate resources. It is also found that headquarters tend to allocate resources to acquired subsidiaries transfer projects to a higher degree than equivalent greenfield ones. Curvilinear effects are found for subsidiary bargaining power with initially positive and subsequently negative effects. Implications for management are discussed.

Keywords: headquarter, subsidiary, resource allocation, bargaining power

INTRODUCTION

In recent years writings' on the multinational enterprise (MNE), it has become almost self-evident that a substantial part of the competitive advantage of MNEs is related to knowledge and more specifically this advantage can be found not only in the capability to develop knowledge but also to transfer knowledge intra-MNE (c.f. Kogut and Zander, 1992; 1993). Knowledge can be characterized as consisting of technological innovations (Teece, 1977) and these innovations are a critical resource for MNEs and for general long-run economic growth (c.f. Baumol, 2002). Innovations have increased in importance for firms in order to create and maintain a competitive advantage and are often a critical factor for value creation (Franko, 1989; Hitt et. al., 1996).

The development of new capabilities in the MNE is not only taking place at headquarters or in the home country. Instead, subsidiaries have been identified as a key actor in the modern MNE irrespective of how this type of organization is conceptualized, i.e. as a 'heterarchy' (Hedlund, 1986), 'transnational firm' (Bartlett and Ghoshal, 1989), 'differentiated network' (Nohria and Ghoshal, 1997) or 'metanational' (Doz et. al., 2001). Subsidiaries provide the MNE with knowledge, ideas and opportunities by being embedded in different business networks (Andersson et. al., 2002). The cost of developing new knowledge is substantial, which in turn has the effect that knowledge transfer is a key activity in the MNE where existing knowledge is exploited elsewhere in the organization thus enhancing the competitive advantage. As noted by Bartlett and Ghoshal (1989), development and dispersion of innovations is a key strategic issue for MNEs which can be derived from internal resources and capabilities (Barney, 1991).

The costs of innovation transfer has been shown to be substantial (Teece, 1977) giving headquarters the opportunity to make use of the internal resource market to allocate corporate resources to a limited number of promising transfer projects in the hope of adding value to the MNE as a whole. Research on the MNE have proposed that an important function of headquarters is to run an internal capital market, which effectively put resources to use in those subsidiaries where headquarters find the best strategic use for them (Shin and Stulz, 1998; Lamont, 1997; Stein, 1997; Mudambi, 1999; Khanna and Tice, 2001). While it may be clear to most observers that headquarters can allocate additional resources to specific subsidiaries and technological innovations, it is less clear as to which subsidiaries and technological innovations receives this support. That is, who (subsidiaries) and what (transfer projects) receives resources from headquarters for innovation transfer projects? By trying to answer these questions we thereby delineate the internal market for MNE resources as dictated by the headquarters in intra-MNE transfer projects. Thus, this paper adds to the insights of intra-MNE competition for headquarters resources from a subsidiary perspective, which previously has received limited attention in the literature besides from a focus on financial resources (Williamson, 1975). However, we do not attempt to explain why potential competition between subsidiaries emerges in the first place. Consequently, this is a first step at filling the gap – and recent call for research – regarding how organizational units compete for resources and especially top management's role in this intra-firm competition (Birkinshaw and Lingblad, 2005).

The reminder of the paper is structured as follows. We outline the theoretical foundations in the next section, and follow by considering a set of hypotheses concerning the headquarters allocation of corporate resources as directed towards specific transfer projects hosted by subsidiaries. After that, we present our data and statistical method which is subsequently

followed by a section presenting the results from the proposed model. This is followed by a discussion of our results and finally we conclude the paper with limitations, suggestions for future research and implications for management.

HEADQUARTERS RESOURCE ALLOCATION AND INNOVATION TRANSFER PROJECTS

Penrose (1959) defined a broader set of resources than only labor, capital and natural resources. Following this, Wernerfelt (1984) considered resources to be anything that can be a strength or a weakness for a firm and he also divided resources into a tangible and an intangible dimension. It was further concluded that no firms can possess exactly the same physical, human and organizational resources. Building on this and following Barney (1991) we classify the available resources for a firm in three main categories; (1) physical capital resources (Williamson, 1975); (2) human capital resources (Becker, 1964) and (3) organizational capital resources (Tomer, 1987). For the purpose of this research, we explicitly focus on the latter two categories. We thereby circumvent the more traditional approaches to resource allocation which have been to investigate competition between units mainly for financial resources. Rather, we argue that competition for human and physical resources that are valuable also occurs and a common denominator is that all of these different types of resources are limited. Hence, a key task for headquarters is to allocate these scarce resources efficiently (Arrow, 1959; Bower, 1970; March and Simon, 1958). The resources allocated by headquarters to innovation transfer projects – besides financial – can of course consist of their expertise and knowledge, but also more specifically time and involvement. Headquarter involvement as we define it in this paper is in line with the resource based view criteria of

being valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991) hence being difficult to source from the external market.

The allocation of corporate resources by headquarters towards promising projects for potential value-adding effects has been put forth as a key activity in multi-unit firms, which is of particular relevance for MNEs (Shin and Stulz, 1998; Lamont 1997; Stein 1997; Mudambi 1999; Khanna and Tice 2001). This rests on the assumption that MNEs operate in resource-constrained environments, implying that all positive net present value projects can not receive corporate resource support. Consequently, the headquarters gets into the position where it has to rank-order projects in deciding which project it deems as most promising. In the rank-ordering process, it becomes obvious that a project is not only picked on its on merits, but rather on its relative merits to other MNE projects, making all projects considered under a time period interdependent. This is derived from the notion that projects, as well as the subsidiaries hosting them, are connected in a network of sometimes vast geographic distances (Hedlund 1986; Bartlett and Ghoshal 1989; Nohria and Ghoshal 1997; Doz et. al., 2001).

The potential value-adding effect of having headquarters involved in the allocation of corporate resources stems mainly from the protection from external markets. That is, instead of having subsidiaries trying to secure additional resources from for example the ordinary loan market or competence from consultancies, they can instead receive resources at a lower cost from within the MNE. The headquarters thus has the ability to support specific resource consuming projects, such as the internal transfer of innovations, shielding them from external markets in the hope to further increase the profitability of the MNE as a whole.

However, allocation of corporate resources is not without its concerns. First of all, the projects supported by headquarters should in general perform better than in-house subsidiary project investments since headquarters actively can choose which projects to support, or even terminate (Stein, 1997). Secondly, this type of allocation may cause potential harm to the MNE since it could possibly create an atmosphere of competition for available resources. This follows from the reality that if headquarters spend more of its resources on one subsidiary it inevitably means that other subsidiaries get less of those. Subsidiaries may engage in rent-seeking activities as a response to the competitive environment of the limited corporate resources available, diverting time from productive effort (Mudambi and Navarra 2004).

Transfer of Innovations – Headquarter and Subsidiary Roles

In exploring who (subsidiaries) and what (transfer projects) receives headquarter resources, we focus on a strategic event of growing importance, namely the diffusion of innovations within MNEs. This highlights a body of research that has focused its attention on the growing dispersal of innovation development within the MNE. Further, the MNE has been characterized as decentralized knowledge management systems (Cantwell, 1989) or even as federations (Andersson et al., 2007). It is frequently stated that MNEs can enhance their innovation development processes and create capabilities by stimulating flows between subsidiaries in order to make better use of the fragmented technology (Buckley and Carter, 1999; Gupta and Govindarajan, 1991; 2000). Moreover, it is suggested that innovation transfer within the MNE is easier to accomplish than the transfer of innovations between independent firms operating on the external market (Grant, 1996; Kogut and Zander, 1992). This also underlines the increasing operational responsibilities that are granted subsidiaries and the dispersal of innovation creating and transferring activities within firms which have loosened the traditional assumptions of hierarchical structures of MNEs (Mudambi and

Navarra 2004). With this follows heterogeneity of the resources available for each subsidiary hosting innovation projects aimed for transfer. We focus directly on the characteristics of subsidiaries and their innovation transfer projects. We acknowledge that innovation transfer projects may fall outside the subsidiaries R&D budget and that there is resource heterogeneity between subsidiaries. Therefore, the current paper does not explicitly focus on how subsidiaries allocate available resources but more accurately on how headquarters allocates corporate resources for the potential benefit of the MNE as a whole.

Headquarters involvement in allocating resources and its implications as a phenomenon is arguably not something new with the original concept of so called smarter-money being discussed by scholars such as Alchian (1969), Williamson (1975) and Donaldson (1984). The general scenario depicts headquarters as possessing superior knowledge concerning both internal and external markets, thus enabling them to develop strategies and allocate resources towards the most promising activities (Forsgren et al., 2005).

The benefits with the type of resource allocation by headquarters discussed in this paper can be derived from the discussion of subsidiary charters and mandates as well as from the centre of excellence (CoE) literature. If the subsidiary is recognized as a CoE in the MNE this means that it posses capabilities that are valuable for the organizations value creation (Frost et. al., 2002). This is in line with the idea that subsidiaries may have capabilities on which the MNE is dependent (Birkinshaw and Hood, 1998). The result then becomes that headquarter involvement at the subsidiary level signals that the subsidiary has the role of a CoE and a specific charter. Thus, headquarter involvement in the transfer process gives the project an organizational legitimacy and increases its trustworthiness. In addition to that, the positive reputation of the project intra-MNE may increase due to these characteristics that follows

from headquarter involvement as well as the perceived importance of the specific innovation and of the transfer project. Finally, the involvement by headquarters in the transfer process may have a positive impact on the innovation and transfer project by increasing the visibility of the transfer project. Consequently, innovations can be identified as a critical resource and headquarter involvement is a double edged sword where it is a control measure used by headquarters that in the end may facilitate the focal subsidiary's strive for autonomy. This access to a critical resource that is important for the entire MNE strengthens the subsidiary power and is one source and reason why subsidiaries engage in autonomy seeking activities (Pfeffer and Salancik, 1978; Pfeffer, 1981; Birkinshaw and Hood, 1998).

HYPOTHESES DEVELOPMENT

We have depicted the MNE as an entity that operates under resource constraints and as a result, headquarters has the opportunity to engage in resource allocation activities across subsidiaries, anticipating adding firm-wide value. This resource allocation is a choice made by headquarters, where they make a decision based upon a set of alternative transfer projects between a sending and a receiving subsidiary intra-MNE. The rationale of this action is the belief that headquarters has a better view of the operations of the multinational group, thus enabling better informed decisions. This would imply that the headquarters may have an important task in operating an internal resource market in terms of having the control rights to allocate resources to the innovation transfer project perceived as most promising. The headquarters thus has power to provide and distribute a portion of its resources to different subsidiaries that in turn have the power to try and obtain the wanted resources. Research even indicates that subsidiaries initially need to convince headquarters that their knowledge is valuable in order for reverse knowledge transfer to take place (Yang et. al., 2008).

By involving themselves in the transfer process between a sending and a receiving subsidiary intra-MNE, headquarters directly or indirectly allocate resources to the transfer project. This resource allocation to specific transfer projects has the effect that some subsidiaries get more tangible and/or intangible resources on the intra-MNE market for resources given the assumption of a limited amount of resources available on this specific market that can be allocated by headquarters. The resources allocated by headquarters to transfer projects can vary in terms of money, time and knowledge etc. (Penrose, 1959; Wernerfeldt, 1984; Barney, 1991). A formal instruction to transfer an innovation from headquarters indicate that they have amongst other things spent time in evaluating the innovation per se and deemed it as eligible for intra-MNE transfer. Direct involvement in the transfer project in various degrees or to take complete responsibility for the innovation transfer project is an additional choice available for headquarters. This implies both a monetary resource commitment but also a commitment in the form of time (alternative cost consideration) and staff etc. (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). Consequently, these are some of various resources subsidiaries are competing for on the intra-MNE market, which have been proposed as a key determinant to intra-MNE power and exchange structures (Pfeffer and Salancik, 1978; Pfeffer, 1981).

Organizations are dependent on both internal and external actors, which in turn affect the policy of the organization and create a dynamic environment (Selznick, 1957). In the MNE a distinction can be made between formal power and actual influence, where headquarters have the formal authority over different decisions and they may also have the actual influence to enforce these decisions. Headquarters have a legitimate power derived from their hierarchical position in the MNE network (Forsgren et. al., 2005). However, in many cases the actual

influence may reside at different subsidiaries which relates to their network position (Forsgren et. al., 2005). One source of subsidiary power is the influence they have over different investment decisions at the focal level. Since innovations have been identified as a key driver for economic growth and MNE competitive advantage the R&D functions of MNEs and their subsidiaries are of utmost importance for the long term development of the organization. Hence, the ability to influence R&D investments is a good proxy for the focal subsidiary's bargaining power. Since the managers of a focal subsidiary have the ability to influence daily operations the freedom to appoint senior managers to your own subsidiary is a sign of autonomy. The opposite, where headquarters assigns managers or use expatriates as a control measure at the subsidiary level (O'Donnell, 2000) implies a less autonomous subsidiary.

Avoiding internal control is similar to the concept of avoiding external control since the effect of control is a loss of autonomy from the subsidiary's point of view. At one point the organization can try to attend to some demands to a certain degree and at other times the organization attend to other demands (Cyert and March, 1963; Pfeffer and Salancik, 1978) irrespective if the control pressures are internal or external. Consequently, this has effects on the amount of influence exerted by a subsidiary and to what degree the subsidiary may be controlled. Additionally, as the resources increase at the subsidiary level this may lead to divergent interests of headquarters and subsidiaries, i.e. greater autonomy is sought at the subsidiary level and it is even possible that the headquarters become dependent on the subsidiary (Ghoshal and Nohria, 1989; Prahalad and Doz, 1981). As a corollary, a curvilinear relationship can be expected if the organization has enough resources, i.e. the subsidiary have gained power through the gaining and retaining of resources and consequently they are not as dependent on headquarters' any more. After a certain point the strive for autonomy becomes

stronger compared to the need for supplementary resources. Therefore the following hypothesis is proposed:

> *Hypothesis 1: In innovation transfer projects the subsidiary's bargaining power has a curvilinear (inverted u-shaped) relationship to the amount of resources allocated by headquarters.*

The writings on subsidiary evolution suggest that in the attempt to become accomplished, be it technological or any other activity, subsidiaries will try to obtain headquarters attention, in order to speed up the process in which they reach the next level in their development (Bouquet and Birkinshaw, 2008). In terms of technological capabilities and from the perspective of the sending subsidiary, they are thus likely to pursue additional resources given that a project is ear-marked for intra-MNE transfer, but only until it a certain degree. Once technologically accomplished, other forces, for example the attempt to gain autonomy are likely to take over, making their wish for headquarters involvement to subsequently decline.

From the headquarters perspective, they are likely to want to involve themselves in those subsidiaries that innovate more compared to other similar subsidiaries within the MNE simply because its wish to bolster promising members of the multinational group and to avoid internal cross-subsidization. However, it can be that after the subsidiary has reached a certain threshold in its technological capabilities, the headquarters may deem additional involvement redundant, leading to a later decline in the degree of involvement. Hence, we propose the following hypothesis:

Hypothesis 2: In innovation transfer projects the subsidiary's technological capabilities has a curvilinear (inverted u-shaped) relationship to the amount of resources allocated by headquarters.

Different entry modes have received a lot of attention in the literature during recent decades (see Andersen, 1997, for a summary) where the internationalization of firms often take place incrementally and in small steps with a gradually increasing resource commitment to the foreign market (Johanson and Vahlne, 1977). Initially, the MNE face the choice between non-equity or equity based entry modes. This paper deals with subsidiaries and consequently the equity based entry modes are of relevance. Then the choice becomes weather to set up a new subsidiary in the host country or to acquire an existing firm and incorporate it in the MNE network, i.e. the choice is between greenfield investment or acquisition. Subsidiaries have been found to be managed differently by headquarters depending on the type of equity entry mode and overall MNE strategy (Harzing, 2002).

There are a number of reasons for headquarters to allocate resources to innovation transfer projects when dealing with both types of equity based entry modes. As previously discussed, control is a central theme in the headquarter-subsidiary relationship. Headquarters automatically gains control by allocating resources to a technology transfer project. Additionally, by involving themselves in the process, shared values may be instilled at the focal subsidiaries which can facilitate the transfer process (Nohria and Ghoshal, 1997). Headquarter involvement may become part of the MNE integration process for the acquired subsidiary that headquarters use as a strategy, thus creating technological interdependencies in the MNE network. This also reduces the information asymmetry between the acquired subsidiary and headquarters (Eisenhardt, 1989; O'Donnell, 2000). Even though a greenfield

subsidiary may need headquarter support since it lacks own experience the need for control is lower compared with an acquired subsidiary. Finally, the acquired subsidiary may posses resources that originally was the reason for it being acquired, thus explaining headquarter involvement.

However, the effect of greenfield investments versus acquired subsidiaries related to headquarter involvement are not clear-cut with supporting separate rationales for both types of entry modes. Hence, there are a number of explanations valid for allocating resources both to a greenfield investment and an acquired subsidiary. Nevertheless, given the limited amount of MNE resources and a competitive situation between these two types of subsidiaries the reasons for allocating resources to acquired subsidiaries tends to be stronger. Consequently, the following hypothesis is proposed:

> *Hypothesis 3: In innovation transfer projects headquarters will allocate more resources to an acquired subsidiary compared to a subsidiary established as a greenfield investment.*

Headquarters control rights to run an internal resource market has been suggested to provide valuable flexibility to move resources from one subsidiary to another (Williamson, 1975; Stein, 1997). However, this requires headquarters to rank-order the investment opportunities amongst the subsidiaries hosting them. The complication then arises if subsidiaries are diversified into unrelated businesses making the rank-order process more difficult, since if the headquarters observes the opportunities with error, it may not be able to rank-order any better than external markets, making the value of flexibility smaller. In order to reduce this possible pitfall, headquarters will be more prone to allocate additional resources to subsidiaries with

familiar activities with the result that the rank-order errors are likely to be similar across all the investment opportunities, making headquarters job of allocating resources valuable, and diversification desirable despite associated costs (Khanna and Tice, 2001). Additionally, the relevance of knowledge between the source and target has been shown to affect the extent of reverse knowledge transfer positively (Yang et. al., 2008). This is close to the idea that headquarters will involve themselves more in the transfer process if the business activities conducted by the developing subsidiary are similar to the headquarters activity. Thus, we hypothesize that:

> *Hypothesis 4: In innovation transfer projects headquarters will allocate more resources to subsidiaries operating in the same main area as the MNE.*

In a similar rationale, it has been shown that internal markets tends to favor established lines of businesses over less established but perhaps more promising businesses (Scharfstein, 1998; Scharfstein and Stein, 2000). This shows that, if this is a result from active strategizing by the headquarters, they will support the transfer projects that are in the main line business, favoring and encouraging innovations that are core to the subsidiary. Whenever headquarters decides to diversify into unrelated business activities, the productivity of their core business has been shown to decline (Schoar, 2002). In line with such reasoning, headquarters would not support the transfer of innovations outside the core business of the subsidiary or firm to the same degree. This imposes the following hypothesis:

> *Hypothesis 5: In innovation transfer projects headquarters will allocate more resources to transfer projects in subsidiaries core technology activities.*

MODEL DEVELOPMENT

The five hypotheses are summarized in figure 1. In the following section the model is confronted with the empirical data.

Insert figure 1 here

Data and methods

This study focuses on technological innovations being transferred from a sending to a receiving subsidiary. The sending and receiving subsidiary always belong to the same MNE, hence the object of study is intra-MNE technology transfer projects.

The data used in this study was collected between 2002 and 2005 from 63 subsidiaries belonging to 23 MNEs. Innovations in subsidiaries were identified through snowball sampling. The sample contains data from 85 specific innovation development projects. Of these 85 innovations 72 are transferred to 169 receivers. Hence, the dataset contains 169 specific innovation transfer projects between a sending and a receiving subsidiary. Different industries are represented in the sample, e.g. manufacturing, telecommunications, transportation and steel. The subsidiaries have a large geographical dispersion across 14 countries in Europe, Asia and the U.S. The number of employees in the subsidiaries ranged from 9 to 6000, with a mean of 589, indicating a well distributed sample both in terms of size and geographical location.

The selection criterion for the innovations studied was based on the novelty and value for the organization of the specific innovation, which is similar to the definition of an innovation as "an idea, practice, or object that is perceived as new by an individual" (Rogers, 1983, p.11). This estimation was done by the innovating/developing subsidiary. Moreover, the innovations had to have the potential of being transferred and also they had to have been completed one to ten years prior to the interview. The data was collected through face-to-face interviews on site at the subsidiaries where the person deemed most appropriate for answering the questionnaire was interviewed for approximately two hours. The respondents had been involved in the development of the innovation and it usually was one or more of the following categories: R&D managers, project managers or subsidiary CEOs etc. Typically, more than one interviewer was involved in the interview process. The questionnaire used was pre-tested in two pilot interviews and minor changes were made in order to eliminate ambiguous questions and phrasings as well as to exclude erroneous indicators. By having access to specific managers with a detailed knowledge of the innovations investigated a deeper understanding of the specific innovations could be gained as well as the possibility to discuss the questions with the respondents. This approach enables the interviewer to target the appropriate respondent and detect inconsistencies in the answers during the interview, hence increasing reliability.

Measures

Dependent variable. If the MNE headquarter is involved in the technological transfer between the sending and receiving subsidiary is measured using a three item construct. *Headquarter involvement in the innovation transfer* is measured by asking the respondents to indicate, on a scale from (1) totally disagree to (7) totally agree, to what extent:<*The MNE HQ has formally instructed you to share this innovation with the counterpart*>, <*The MNE HQ have themselves been heavily involved in conducting the actual*

transfer process with the counterpart> and finally <The MNE HQ have taken complete responsibility for the transfer of this innovation to this counterpart>. Internal reliability of the construct was satisfactory with a Cronbach alpha of 0.697. The factor score from the factor analysis was used as the dependent variable in the regression analysis, see table 1.

Independent variables. The subsidiary *bargaining power* is measured using a two item construct by asking the respondents to indicate, on a scale from (1) HQ decides alone to (4) equal influence up to (7) unit decides alone, what the relative influence of the subsidiary was compared to the divisional headquarters regarding:<*Deciding on investments in R&D> and <Appointing senior managers to the unit*>. The internal reliability of the construct was below the recommended level of 0.7 (Nunnally, 1978) with a cronbach alpha of 0.611. However, the construct is used since alpha tests in general are considered to be conservative and with the same mean inter item correlation (MIC) and the inclusion of additional variables the alpha increases (Carmines and Zeller, 1979, p.45). When this is considered together with the principal component analysis accounted for in table 1 where both the factor loadings and communalities extracted are high it indicates that the construct can be used. The MIC exceeded the optimal level of 0.2-0.4 (Briggs and Cheek, 1986), with a MIC of 0.447. However, this measure still does not exceed the 0.5 level where Briggs and Cheek (1986) cautions that when exceeding this level "the items on a scale tend to be overly redundant and the construct measured too specific" (p. 115). The extracted factor score from the factor analysis was used in the regression analysis.

The sending *subsidiary's technological capabilities* are measured using a three item construct where the respondents were asked to indicate, on a scale from (1) totally disagree to (4) neither/nor up to (7) totally agree, weather:<*You develop many more core technology*

innovations compared to other units in your division/business area>, <You develop many more product innovations compared to other units in your division/business area> and finally <You develop many more production process innovations compared to other units in your division/business area>. In the regression analysis the extracted factor score from the factor analysis was used. Internal reliability of the scale exceeded the recommendations (Nunnally, 1978) with a Cronbach alpha of 0.795.

Subsidiary *entry mode* relates to weather or not the sending subsidiary was acquired or originally set up as a greenfield investment. This variable is dichotomously coded where greenfield investments were used as the baseline.

Subsidiary relatedness is a single item measure where the respondents have been asked to indicate on a scale from (1) not at all to (7) very much:<*To what extent they consider their unit unique in relation to other MNE units concerning core activities*>. This item was included in the factor analysis and loaded as an own factor. Hence, this factor was used in the following regression.

Technological relatedness is a dummy variable indicating if the technological innovation that was subject to transfer was considered to be part of the core business or not, coded 1 if yes and 0 if not.

Control variables. The *subsidiary's size*, measured as the natural log of its number of employees is a good proxy for many characteristics related to the subsidiary, i.e. how important the subsidiary is intra-MNE and in the external environment etc. Received theory has identified that large subsidiaries have greater intra-firm bargaining power

(Mudambi and Navarra, 2004) and that it is easier to transfer knowledge if the subsidiary is large even if the knowledge relevance is low (Yang et. al., 2008). Similarly, the other side of the coin is thus the *size of the MNE*, which is included and measured as the natural logarithm of the number of employees in the MNE. We also included another characteristic of the MNE in terms of its international scope or multinational diversity. This variable, *MNE multinational diversity,* was inserted as the natural logarithm of the number of countries the MNE had subsidiaries in. Two other internationality controls were included, *subsidiary-headquarter cross-border* and *subsidiary-subsidiary cross-border transfer*. First, we controlled for if the headquarters and subsidiary was located in the same country and secondly we controlled for if the transfer was to be taken place cross-boarder or not. These controls were inserted as dummy variables taking the value 1 if yes, and 0, if not. A single indicator reflecting headquarters prior financial commitment to the development phase of the technological innovation, *technology development financing*, was included. This was measured on scale from 1 (not at all) to 7 (very much) by asking the respondents: <*To what extent has corporate headquarters financed the development of the innovation*>.

A single macroeconomic variable was used when we included GDP of the sending subsidiary's home country total as measured in the total GDP in 2005 U.S. dollars as a proxy for the munificence of the local technological and business environment. The data was collected from the GGDC total economy database.

Finally, we included a dummy variable pertaining to the specific technology that is subject to transfer in terms of it has been awarded a *patent* or was under review at a patent office. In the issue of high versus low technological innovations, patents have previously been used as an

indicator (Trajtenberg, 1990) and also as a marker of technical importance (Albert et. al., 1991).

Common method bias and multicollinearity

This study employs self reported data on most variables and as a consequence there is a risk of common method bias augmenting relationships. In order to check for such bias Harman's one factor test was employed (Podsakoff and Organ, 1986). All relevant indicators were examined in a factor analysis (principal component with Varimax rotation and Kaiser normalization). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was employed to test if a factor analysis was appropriate. The KMO-value exceeded the recommended level of 0.6 with a KMO-value of 0.649 (Tabachnick and Fidell, 2001). Additionally, the Bartlett's test of sphericity showed a $p<0.001$ significance level indicating that sufficient correlations exist between the indicators (Hair et. al., 2006). The factor analysis indicated validity of the data and reported good properties. Four factors were extracted in the factor analysis with an eigen value exceeding 1 explaining 77.349 percent of the total variance. The eigen value for the fifth factor extracted was 0.622 and only explaining 6.909 percent of the variance in relation to the extraction sums of squared loadings and consequently was not considered for inclusion. In the following statistical analysis, the scores for the extracted factors were used as variables in the regression. In the rotated factor solution the cut off value of 0.32 was used and only one cross loading appeared. The second item in the factor technological capabilities loaded with a value of 0.410 on the factor subsidiary bargaining power. This can not be considered to raise any major concerns even though the presence of common method bias can not be excluded. However, it is not likely to cause any major issues when interpreting the data.

Insert table 1 here

The variance inflation factor (VIF) was calculated for all the predictor variables in all models in order to check for potential problems of multicollinearity, see table 2. Multicollinearity is an indicator of a correlation between two or more predictor variables and can make the dataset biased if present and as a consequence the estimated model can show a high R^2 value because of multicollinearity. There is no consensus as to what threshold should be applied for when multicollinearity can be said to exist (Pitard and Viel, 1997). Common cut-off points for VIF-values are usually set around 5 (Stedenmund, 1992) or even at 10 (Hair et. al., 2006; Marquardt, 1970). No VIF-value in any of the models exceeded 5. In the final model the highest VIF-value calculated was for the squared variable for subsidiary bargaining power with a value of 4.194 and the mean VIF-value in this model for the 15 predictor variables were 2.510. Consequently, we see no reason for multicollinearity to cause any misinterpretation of the predictive ability of regression model results (Hair et. al., 2006).

Insert table 2 here

RESULTS

The correlation matrix of the variables is shown in table 3 which also reports on the mean values and standard deviations of the variables. The variables show only modest correlations, the highest being Pearson r of 0.464 ($p<0.001$) between the size of the MNE and its multinational diversity. This makes intuitive sense; a corollary of being a large MNE is also that it has operations in many countries.

This article examines when headquarters decides to allocate resources to subsidiaries and if this is always deemed as desirable from the perspective of the focal subsidiary. Furthermore, the article tests if subsidiaries that gets resources have any specific characteristics. Our research hypotheses were tested using hierarchical regression analysis. In the first specified model, only control variables were entered. Secondly, the main effects for headquarter resource allocation were specified. In the third specification, we entered squared terms to test for curvilinearity. Table 4 reports the parameter estimates of all regression models. The adjusted R^2 values for model 2 and 3 are 0.359 and 0.405 respectively. Hence, when the squared terms are included the explanatory value of the models increases. Additionally, the F statistics' increases with every model and all three models are significant ($p<0.001$). Furthermore, the increase in F-value from model 1 to 2 and from model 2 to 3 is significant. This supports the chosen model specifications and no VIF-values are significant in any of the models.

We find a curvilinear relationship (inverted u-shaped) for subsidiary bargaining power and headquarter involvement in the innovation transfer. In model 3 the coefficient is significantly positive ($p<0.001$) for subsidiary bargaining power and when this factor is squared a significant ($p<0.01$) negative relationship is found. Consequently, support is found for hypothesis 1. We find no significant relationships in any model between the technological capabilities of the subsidiary and headquarter involvement. In every specification the coefficient is positive but not significant. Hence, no support is found for our second hypothesis. When headquarter allocates resources to subsidiaries our data shows that they favor acquired subsidiaries. This finding is significant ($p<0.001$) in both model 2 and 3. Hence support is found for hypothesis 3. Subsidiary relatedness did not return as significant in any of the models. Hence, no support is found for hypothesis 4. Consistent with hypothesis 5,

technological relatedness was positively related to headquarter involvement in the innovation transfer process between the sending and receiving subsidiary with a coefficient of 0.350 ($p<0.001$) in model 2 and a coefficient of 0.296 ($p<0.01$) in model 3. Consequently, hypothesis 5 is supported. In addition to our hypotheses some of the control variables returned as significant in the regression analysis. This and our other findings will be discussed in the following section.

Insert table 3 and 4 here

DISCUSSION

Our results indicate that subsidiaries initially seek resources of headquarters. However, as subsidiaries evolve, they also become more autonomous. The reason for this may be because they are given the role of a CoE (Holm and Pedersen, 2000; Frost et. al., 2002) or that the subsidiary is granted a specific mandate (Birkinshaw, 1996; Birkinshaw and Hood, 1998). This formal role assigned to the subsidiary signals an importance intra-MNE and puts the subsidiary in a position to exert power in the network, both over other sister subsidiaries and in relation to headquarters. A distinction between formal power and actual influence in the organization can be made (Forsgren et. al., 2005) and in our situation headquarters can retain formal power but subsidiaries gain actual influence, i.e. subsidiary bargaining power. Additionally, the involvement by headquarters indicates that the specific innovation is deemed as transfer worthy by headquarters. This in turn increases the visibility, legitimacy and perceived importance of the innovation and the transfer project. A corollary being that the innovation is considered to be a critical resource which is a source for power in the MNE (Pfeffer and Salancik, 1978; Pfeffer, 1981). This access to a critical resource increases the

subsidiary autonomy and bargaining power, but the foundations for this organizational influence can to some extent be traced back to the involvement by headquarters in the innovation transfer process. Which one of these forces, i.e. control vs. autonomy, is strongest can not be explained with our current dataset. It may be that the MNE headquarter stops giving support because it is not actively sought after from the focal subsidiary. This would be consistent with the reasoning by Yang et. al. (2008) that subsidiaries need to convince headquarters of the knowledge relevance in order for reverse knowledge transfer to take place. On the other hand, headquarters may not want to allocate resources because of the fact that the subsidiaries have become autonomous and have the ability to manage their own operations. These insights add to theories of subsidiary evolution in the context of intra-firm competition.

A surprising finding is that our data does not support the notion that subsidiaries with a high degree of technological capabilities receives more headquarter resources. The reason for this may be that subsidiaries already possess enough resources and that they do not seek additional resources from headquarters. Additionally, a situation where headquarters may want to create equality between subsidiaries intra-MNE may be present. Hence, this can also be an explanation to our findings. In terms of relatedness, our results indicate that it is the technological relatedness, and not the operational relatedness that is decisive for to whom headquarters allocates resources. Transfer projects that are picked as winners in the MNE are the ones that are related to the core capabilities of the subsidiary. This finding is of strategic importance for how a subsidiary should act in order to receive the attention of headquarters and be granted a mandate or a formal position as an e.g. CoE. Additionally, acquired subsidiaries tend to get systematically favoured, as opposed to greenfield investments, when headquarter allocates resources. The reason to this may be that headquarters wants to exploit

the acquisition and that this was one reason why the unit was acquired in the first place. Additionally, headquarter involvement implies control and an acquired subsidiary has a different organizational history compared to greenfield investments. Hence, by involving themselves at the subsidiary level, headquarters have the possibility to instil shared values as a means to create internal consistency (Nohria and Ghoshal, 1997). Furthermore, large subsidiaries seems to get favoured for headquarter resource allocation. Hence, it is easier for these subsidiaries to get the attention of headquarters. This finding is not surprising and is consistent with results from previous studies depicting that subsidiary size matters for knowledge transfer (e.g. Gupta and Govindarajan, 2000). We add to these findings by observing that subsidiary size attracts greater headquarter attention and intervention possibly because of their greater economic value and higher visibility. MNE size is in turn correlated to multinational diversity and our results indicate that it is easier to get resources from headquarters in an MNE that to a lesser extent is internationally diversified. This means that subsidiaries have easier to get support from 'focused' organizations. These findings are of relevance in M&A situations if the target subsidiary about to be acquired has different options in terms of bidders. Then the choice between what MNE to choose is important if headquarter involvement is deemed as important for the unit about to be acquired. Also, subsidiaries located in more economically developed countries gets favoured for headquarter resources. This can be explained by the fact that spillover effects from the local environment to the subsidiaries often occurs (Blomström and Kokko, 1998; Holm, Malmberg and Sölvell, 2003) and that headquarter hopes that these effects will be augmented by their involvement. Finally, we find that headquarters tends to stick with innovation projects that they have funded in the development stage in the subsequent transfer phase. Our study has primarily been concerned with projects that are picked as winners in the transfer phase, but these results also indicates that headquarters tend to stick with projects that they have identified as winners in the

development phase, i.e. winner-sticking. Hence, we not only add to the understanding of winner-picking but also to the winner-sticking situation.

CONCLUDING REMARKS – LIMITATIONS, FUTURE RESEARCH AND MANAGERIAL IMPLICATIONS

The present study is a first step at exploring headquarters involvement in relation to intra-firm competition. When discussing resources we explicitly exclude financial resources which can be seen as a limitation of our study and an arena for further research. If headquarters allocate different kinds of resources differently is an interesting area for investigation. Furthermore, some of our measurements consist of subjective estimations made by the respondents. The usage of perceptual measurements may be problematic because of social desirability and self-assessment biases. However, this is mediated by the fact that our data is collected from key informants through face-to-face interviews. Finally, another limitation is that we only have data from the subsidiary perspective and not from headquarters which may bias the results in favour of the subsidiary view.

New arenas for further research would be to delve in to the role of headquarters for transfer performance. Even if headquarters decides to involve themselves in the transfer process, we lack knowledge if they affect transfer performance efficiency and effectiveness. One research question to investigate would then be to investigate if headquarter involvement add any additional value to the transfer process? Furthermore, the control and autonomy dimension has been thoroughly investigated. However, the question of how these forces interact in the setting of intra-firm competition needs to be further investigated. How the specific innovation characteristics affect headquarter involvement is also one area for further research and a more

fine grained measure of distance between subsidiaries and headquarters could be developed in relation to when and why headquarters involves themselves in operations at the subsidiary level.

Our research also has important implications for managers in e.g. M&A situations depending on if the managers should expect headquarter involvement or not in some situations. Furthermore, our findings indicate what factors are important for headquarters when they allocate resources. Hence, managers at the subsidiary level can frame their communication and perception of the focal subsidiary in different ways in order to get or not to get headquarters support depending on if resources are valued or if autonomy is desired.

REFERENCES

Albert, M. B., Avery, D., Narin, F. and McAllister, P. (1991). 'Direct validation of citation counts as indicators of industrially important patents', *Research Policy*, 20(3): 251-259.

Alchian, A.A., (1969) Corporate management and property rights, in: Manne, H. (ed.), *Economic Policy and the Regulation of Corporate Securities*, Washington, DC: American Enterprise Institute: 337–360.

Andersen, O. (1997) 'Internationalization and market entry mode: A review of theories and conceptual frameworks' *Management International Review*, Special issue (2): 27-42.

Andersson. U. and Forsgren, M. and Holm, U. (2002) 'The Strategic Impact of External Networks: Subsidiary Performance and Competence Development in the Multinational Corporation', *Strategic Management Journal*, 23(11): 979-996.

Andersson, U., Forsgren, M. and Holm, U. (2007) 'Balancing Subsidiary Influence in the Federative MNC – a Business Network Perspective', *Journal of International Business Studies*, 38(5): 802-818.

Arrow, K.J. (1959) 'Control in large organizations', *Management Science*, 10(3): 397-408.

Barney, J. (1991) 'Firm resources and competitive advantage', *Journal of Management,* 17(1): 99-120.

Bartlett, C.A. and Ghoshal, S. (1989) Managing Across Borders. The Transnational Solution. Harvard Business School Press: Boston Massachusetts.

Baumol, W.J. (2002) The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism, Princeton University Press.

Becker, G.S. (1964) Human Capital. New York: Colombia.

Bower, J.L. (1970) Managing the Resource Allocation Process. Richard D. Irwin, ed. Harvard University Press: Boston, MA.

Birkinshaw, J. (1996) 'How Multinational Subsidiary Mandates are Gained and Lost', *Journal of International Business Studies,* 27(3): 467-495.

Birkinshaw, J and Hood, N. (1998) 'Multinational Subsidiary Evolution: Capability and Charter Change in Foreign-Owned Subsidiary Companies', *Academy of Management Review*, 23(4): 773-795.

Birkinshaw, J. and Lingblad, M. (2005) 'Intrafirm Competition and Charter Evolution in the Multibusiness Firm', *Organization Science*, 16(6): 674-686.

Blomström, M. and Kokko, A. 'Multinational Corporations and Spillovers', *Journal of Economic Surveys,* 12(3): 247-277.

Bouquet, C. and Birkinshaw, J. (2008) 'Weight versus Voice: How Foreign Subsidiaries capture the Attention of Corporate Headquarters', *Academy of Management Journal,* 51(3): 577-601.

Briggs, S.R. and Cheek, J.M. (1986) 'The role of factor analysis in the development and evaluation of personality scales', *Journal of Personality*, 54(1): 106-148.

Buckley, P.J. and Carter, M.J. (1999) 'Managing Cross-Border Complementary Knowledge: Conceptual Developments in the Business Process Approach to Knowledge Management in Multinational Firms', *International Studies of Management and Organization*, 29(1): 80-104.

Cantwell, J. (1989) Technological Innovation and Multinational Corporations, Oxford: Basil Blackwell.

Carmines, E.G. and Zeller, R.A. (1979) Reliability and Validity Assessment. Sage, Beverly Hills, CA.

Cyert, R.M. and March, J.G. (1963) A Behavioral Theory of the Firm. Englewood Cliffs, N.J.: Prentice Hall.

Donaldson, G., *Managing Corporate Wealth*, New York: Praeger 1984.

Doz, Y. and Prahalad, C.K. (1981) 'Headquarters influence and strategic control in MNCs', *Sloan Management Review*, 23(1): 15-29.

Doz, Y., Santos, J. and Williamson, P. (2001) From Global to Metanational. How Companies Win in the Knowledge Economy. Harvard Business School Press: Boston Massachusetts.

Eisenhardt, K.M. (1989) 'Agency Theory: An Assessment and Review', *Academy of Management Review,* 14(1): 57-74.

Franko, L.G. (1989) 'Global Corporate Competition: Who's Winning, Who's Losing, and the R&D Factor as One Reason Why' *Strategic Management Journal*, 10(5): 449-474.

Forsgren, M., Holm, U. and Johanson, J. (2005) Managing the Embedded Multinational. Edward Elgar Publishing, Cheltenham, UK.

Frost, T., Birkinshaw, J. and Ensign, P.C. (2002) 'Centre of Excellence in Multinational Corporations', *Strategic Management Journal*, 23(11): 997-1018.

Ghoshal, S. and Nohria, N. (1989) 'Internal Differentiation within Multinational Corporations', *Strategic Management Journal,* 10(4): 323-337.

Grant, R.M. (1996) 'Towards a Knowledge Based Theory of the Firm', *Strategic Management Journal*, 17: 109-122.

Gupta, A.K. and Govindarajan, V. (1991) 'Knowledge Flows and the Structure of Control within Multinational Corporations', *Academy of Management Review,* 16(4): 768-792.

Gupta, A.K. and Govindarajan, V. (2000) 'Knowledge Flows within Multinational Corporations', *Strategic Management Journal*, 21(4): 473-496.

Hair, Joseph F., Black, William C., Babin, Barry J., Anderson, Rolph E. and Tatham, Ronald L. (2006) Multivariate Data Analysis. 6ed. Upper Saddle River, New Jersey: Prentice Hall.

Harzing, A.-W. (2002) 'Acquisitions versus Greenfield Investments: International Strategy and Management of Entry Modes' *Strategic Management Journal*, 23(3): 211-227.

Hedlund, G. (1986) 'The Hypermodern MNC – a Heterarchy', *Human Resource Management*, 25(1): 9-35.

Hitt, M.A., Hoskisson, R.E., Johnson, R.A. and Moesel, D.D. (1996) 'The Market for Corporate Control and Firm Innovation' *The Academy of Management Journal*, 39(5): 1084-1119.

Holm, U., Malmberg, A. and Sölvell, Ö. (2003) 'Subsidiary impact on host-country economies – the case of foreign-owned subsidiaries attracting investments into Sweden' *Journal of Economic Geography,* 3(4): 389-408.

Holm, U. and Pedersen, T. (2000) The Emergence and Impact of MNC Centres of Excellence: A Subsidiary Perspective. MacMillan, London.

Johanson, J. and Vahlne, J-E. (1977) 'The Internationalization Process of the Firm – a Model of Knowledge Development and Foreign Market Commitment' *Journal of International Business Studies*, 8(1): 23-32.

Khanna, N. and Tice, S. (2001) 'The Bright Side of Internal Capital Markets', *Journal of Finance*, 56(4): 1489-1528.

Kogut, B. and Zander, U. (1992) 'Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology', *Organization Science*, 3(3): 383-397.

Kogut, B. and Zander, U. (1993) 'Knowledge of the firm and the evolutionary theory of the multinational corporation', *Journal of International Business Studies*, 24(4): 625-645.

Lamont, O. (1997) 'Cash Flow and Investment: Evidence from Internal Capital Markets', *Journal of Finance*, 52(1): 83-109.

March, J.G. and Simon, H.A. (1958) Organizations. John Wiley, New York.

Marquardt, D.W. (1970) 'Generalized inverses, ridge regression, biased linear estimation and non-linear estimation', *Technometrics,* 12(3): 591-612.

Mudambi, R. (1999) 'MNE internal capital markets and subsidiary strategic independence', *International Business Review*, 8(2): 197-211.

Mudambi, R. and Navarra, P. (2004) 'Is knowledge power? Knowledge flows, subsidiary power and rent-seeking within MNCs', *Journal of International Business Studies*, 35(5): 385-406.

Nohria, N. and Ghoshal, S. (1997) The Differentiated Network: Organizing Multinational Corporations for Value Creation. Jossey-Bass, San Francisco, California.

Nunnally, J. (1978) Psychometric theory. 2nd ed. New York, Mc-Graw Hill.

O'Donnell, S.W. (2000) 'Managing Foreign Subsidiaries: Agents of Headquarters, or an Interdependent network?' *Strategic Management Journal*, 21(5): 525-548.

Penrose, E.T. (1959) The Theory of the Growth of the Firm. Basil Blackwell, Oxford.

Pfeffer, J. (1981) Power in Organizations. Marshfield, MA: Pitman.

Pfeffer, J. and Salancik, G.R. (1978) The External Control of Organizations: a Resource Dependency Perspective. Stanford business books. New York: Harper & Row.

Pitard, A. and Viel, J.F. (1997) 'Some methods to address collinearity among pollutants in epidemiological time series' *Statistics in Medicine*, 16(5): 527-544.

Podsakoff, P.M. and Organ, D. (1986) 'Self-Reports in Organizational research: Problems and Prospects', *Journal of Management* 12(4): 531-544.

Rogers, E. (1983) Diffusion of Innovations, 3rd ed. New York: Free Press.

Scharfstein, D.S. (1998) The dark side of internal capital markets II: Evidence from diversified conglomerates, NBER Working Paper, no. 6352, January.

Scharfstein, D.S. and Stein, J. (2000) 'The Dark Side of Internal Capital Markets: Divisional Rent-Seeking and Inefficient Investment' *Journal of Finance,* 55(6)*:* 2537-2564.

Shin, H. and Stulz, R.M. (1998) 'Are Internal Capital Markets Efficient?', *The Quarterly Journal of Economics*, 113(2): 531-552.

Schoar, A. (2002) 'Effects of corporate diversification on productivity' *Journal of Finance* 57(6): 2379–2403.

Selznick, P. (1957) Leadership in Administration: A Sociological Interpretation. Evanston, IL: Row, Peterson.

Stedenmund, A.H. (1992) Using economics. A practical guide, 2nd edition. New York: Harper Collins.

Stein, J. (1997) 'Internal Capital Markets and the Competition for Corporate Resources', *Journal of Finance*, 52(1): 111-133.

Tabachnick, B.G. and Fidell, L.S. (2001) Using multivariate statistics. 4th ed. New York, Harper Collins.

Teece, D.J. (1977) 'Technology Transfer by Multinational Firms: The Resource Cost of Transferring Technological Know-how' *Economic Journal*, 87(346): 242-261.

Tomer, J.F. (1987) Organizational capital: The path to higher productivity and well-being. New York: Praeger.

Tratjenberg, M. (1990) 'A Penny for Your Quotes: Patent Citations and the Value of Innovations', *The RAND Journal of Economics*, 21(1): 172-187.

Wernerfelt, B. (1984) 'A Resource-Based View of the Firm', *Strategic Management Journal*, 5(2): 171-180.

Williamson, O.E. (1975) Markets and hierarchies, analysis and antitrust implications: A study in the economics of internal organization. Free Press: New York.

Yang, Q., Mudambi, R. and Meyer, K. (2008) 'Conventional and reverse knowledge flows in multinational corporations', *Journal of Management*, Forthcoming.

Table 1 Factor analysis with varimax rotation

Variable	Factor loadings		Communality
Factor 1: Headquarter involvement in the innovation transfer			
The MNE HQ has formally instructed you to share this innovation with the counterpart	0.837		0.727
The MNE HQ have themselves been heavily involved in conducting the actual transfer process with the counterpart	0.792		0.764
The MNE HQ have taken complete responsibility for the transfer of this innovation to this counterpart	0.775		0.602
Eigenvalue		1.987	
% Variance		22.077	
Factor 2: Subsidiary bargaining power			
Relative influence on deciding on investments in R&D	0.819		0.734
Relative influence on appointing senior managers in your unit	0.835		0.713
Eigenvalue		1.282	
% Variance		14.244	
Factor 3: Technological capabilities			
You develop many more core technology innovations compared to other units in your division/business area	0.869		0.814
You develop many more product innovations compared to other units in your division/business area	0.789		0.798
You develop many more production process innovations compared to other units in your division/business area	0.905		0.827
Eigenvalue		2.689	
Variance		29.878	
Factor 4: Subsidiary relatedness			
To what extent they consider their unit unique in relation to other MNE units concerning core activities	0.989		0.982
Eigenvalue		1.004	
% Variance		11.150	
Total variance explained		77.349	

Table 2 Variance inflation factor scores

Variable	Model 1 VIF	Model 2 VIF	Model 3 VIF
1. Headquarter involvement in the innovation transfer	-	-	-
2. Subsidiary size	1.330	1.802	1.888
3. Technology development financing	1.255	1.403	1.838
4. Patent	1.074	1.392	1.473
5. MNE size	2.579	3.055	4.011
6. Multinational diversity	2.408	3.027	3.965
7. GDP	1.173	1.585	3.161
8. Subsidiary-headquarter cross-border	1.482	3.126	3.298
9. Subsidiary-subsidiary cross-border	1.052	1.202	1.252
10. Subsidiary bargaining power	-	1.961	2.441
11. Technological capabilities	-	1.972	2.027
12. Entry mode	-	1.786	1.849
13. Subsidiary relatedness	-	1.397	1.669
14. Technology relatedness	-	1.679	1.758
15. Subsidiary bargaining power SQ	-	-	4.194
16. Technological capabilities SQ	-	-	2.835

Table 3 Correlations and descriptive statistics [a]

	Mean	Std. Deviation	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Headquarter involvement in the innovation transfer	0.000	1.000													
2. Subsidiary size	5.518	1.588	1.000												
3. Technology development financing	1.809	1.927	-0.005	1.000											
4. Patent	0.569	0.496	-0.175*	-0.085	1.000										
5. MNE size	10.090	1.374	0.328**	-0.181**	-0.106	1.000									
6. Multinational diversity	4.002	0.788	0.000	-0.206**	0.008	0.464**	1.000								
7. GDP	9.914	0.144	0.162*	0.091	-0.166*	0.059	0.303**	1.000							
8. Subsidiary-headquarter cross-border	0.507	0.501	0.220**	0.060	-0.239**	0.352**	-0.039	0.219**	1.000						
9. Subsidiary-subsidiary cross-border	0.787	0.411	0.072	0.036	-0.027	0.064	-0.098	0.098	0.079	1.000					
10. Subsidiary bargaining power	0.000	1.000	-0.292**	-0.107	0.235*	0.076	0.431**	0.054	-0.356**	-0.095	1.000				
11.Technological capabilities	0.000	1.000	0.130	-0.059	-0.165	-0.017	-0.119	-0.051	-0.450**	0.016	-0.021	1.000			
12. Entry mode	0.392	0.489	0.028	-0.046	0.066	0.233**	0.190**	-0.134	0.243**	-0.167*	0.239*	-0.356**	1.000		
13. Subsidiary relatedness	4.986	1.900	-0.331**	-0.015	0.056	0.163	0.146	-0.185*	0.083	0.048	-0.017	-0.001	-0.067	1.000	
14. Technology relatedness	0.311	0.464	-0.125	0.027	-0.021	-0.251**	-0.222**	-0.375**	-0.309**	-0.156*	-0.008	0.100	-0.032	0.088	1.000

[a] Spearman's correlation coefficients reported.

*Correlation is significant at the 0.05 level (2-tailed).

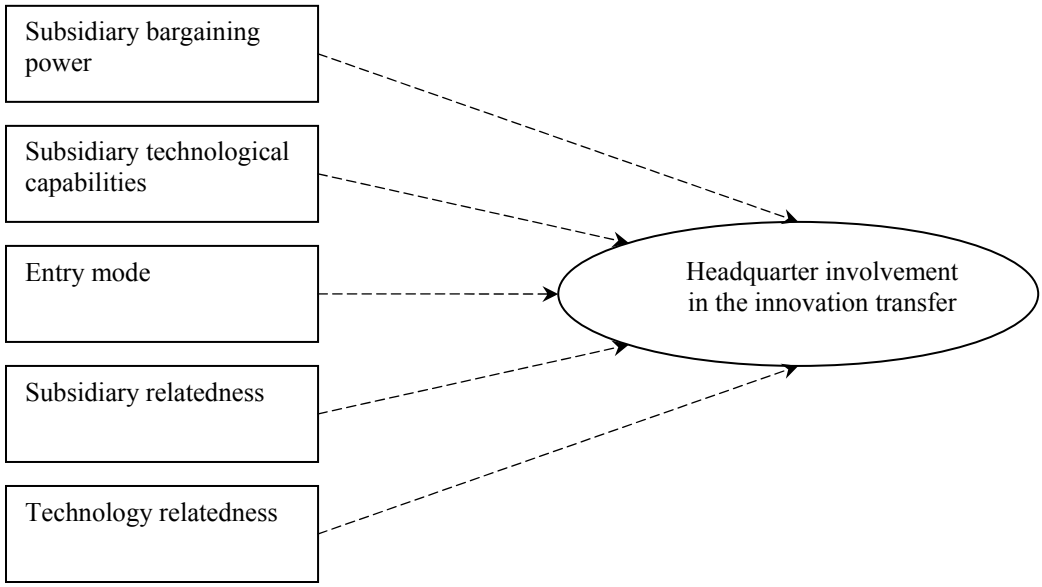
**Correlation is significant at the 0.01 level (2-tailed).

Table 4 Results from the hierarchical regression analysis [a]

Regressor	Model 1		Model 2		Model 3	
	β	s.e.	β	s.e.	β	s.e.
Subsidiary size	0.181†	0.063	0.262*	0.064	0.200*	0.063
Technology development financing	0.297**	0.053	0.328***	0.049	0.472**	0.054
Patent	-0.161†	0.180	-0.128	0.179	-0.174†	0.177
MNE size	-0.130	0.108	-0.078	0.103	0.119	0.113
Multinational diversity	-0.066	0.179	-0.243†	0.175	-0.442**	0.193
GDP	-0.149	0.737	0.140	0.750	0.368**	1.019
Subsidiary-headquarter cross-border	0.145	0.209	0.213	0.266	0.125	0.263
Subsidiary-subsidiary cross-border	-0.158†	0.204	-0.034	0.191	-0.067	0.188
Subsidiary bargaining power			0.261*	0.105	0.394***	0.113
Technological capabilities			0.180†	0.106	0.139	0.103
Entry mode			0.383***	0.201	0.326***	0.197
Subsidiary relatedness			0.142	0.089	0.079	0.094
Technology relatedness			0.350***	0.208	0.296**	0.205
Subsidiary bargaining power SQ					-0.461**	0.110
Technological capability SQ					0.199	0.105
Diagnostics						
N	169		169		169	
R^2	0.221		0.432		0.484	
Adj.R^2	0.161		0.359		0.405	
ΔR^2	-		0.212		0.052	
F-statistics	3.714***		5.861***		6.131***	
ΔF-statistics	-		2.147***		0.270**	

[a] Standardized parameter estimates reported.
†p<0.1, *p<0.05, **p<0.01, ***p<0.001

Figure 1


Subsidiary bargaining power
Subsidiary technological capabilities
Entry mode
Subsidiary relatedness
Technology relatedness
Headquarter involvement in the innovation transfer