

**KNOWLEDGE TRANSFER EFFECTIVENESS IN THE MULTINATIONAL
CORPORATION-
MOTIVATIONAL BARRIERS AND FORMAL CONTROL MECHANISMS**

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Abstract

This paper addresses if motivational barriers to knowledge transfer in sub-units of the multinational corporation (MNC) influences transfer effectiveness negatively. Moreover it examines what impact formal control mechanisms from headquarters have on transfer effectiveness. Robust results are found indicating that hesitation to transfer in the sender sub-unit have a negative influence on transfer effectiveness. The results also indicate that hesitation to knowledge sharing in both the sender and the receiving sub-unit have a higher degree of negative impact on transfer effectiveness compared to only hesitation in the sender sub-unit. Mixed results are found regarding what impact formal control mechanisms have on transfer effectiveness. Formal demand to transfer from headquarters negatively impacts on transfer effectiveness, whereas formal evaluation system related to transfer has a positive affect on transfer effectiveness. A sample of 80 knowledge transfer processes was subjected to an OLS regression analysis.

Keywords: transfer performance, formal control mechanisms, headquarters, sub-unit transfer

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This paper examines how motivational barriers to transfer and how formal control mechanisms from headquarters influence knowledge transfer effectiveness. During the last decade the role of knowledge sharing within MNC has received an increased research interest. Today knowledge sharing is regarded both by researcher and practitioners as a need for firm success (Bertlett & Gosha, 1989; Hedlund, 1994; Kogut & Zander, 1992). In accordance with these perspectives, sustained competitive advantage is attained by a superior organizational capability to manage different knowledge resources within the firm (Kogut & Zander, 1992, 1996). The literature has presented several factors as influencing knowledge transfer processes in MNC. Much attention in previous research on knowledge transfer has been giving to knowledge transfer flows, especially two questions has been addressed, why they take place, and factors which support or hinder these flows (Szulanski, 1996; Gupta & Govindarajan, 2000; Tsai, 2001). Following the knowledge-based view and the network-based view of the firm one of the advantages of the MNC is its ability to create and transfer knowledge. However, it is not the flows in themselves that are vital in creating competitive advantage or adding to the knowledge stock of the MNC. For knowledge transfer to add and contribute in terms of innovation capability both at the sub-unit level and at the overall organization level, the knowledge being transferred needs to be adopt and used by the receiving sub-unit (Gupta & Govindarajan, 2000; Foss & Pedersen, 2002). Follow, Foss and Pedersen (2002), headquarters should use formal control mechanisms in order to enhance knowledge transfer flows. Despite several empirical studies showing how formal control mechanism influences knowledge transfer flows there is still a lack of knowledge of how these formal control mechanisms affect knowledge transfer effectiveness.

Focusing on motivational barriers to knowledge transfer, previous research has showed that it has a negative impact on knowledge transfer. Both unwillingness to share and send knowledge in sub-units of the MNC decreases knowledge transfer flows (Cohen & Levinthal, 1990; Suzlanski, 1996; Suzlanski, 1996; Forsgren, 1997). However, again little research is done on how motivational barriers interact with each other and influences knowledge transfer effectiveness. In an attempt to answer the question of how motivational transfer barriers and formal control mechanism impact transfer effectiveness, the present paper takes a closer look at and contributes by examine how the motivational barrier of hesitation to transfer influences transfer effectiveness, and how the two formal control mechanism; formal demand, and evaluation systems related to transfer affects transfer effectiveness.

The disposition of the paper is following. First, a short review of the literature that describes knowledge transfer barriers and management of them will be presented thereafter, motivational barriers together with formal control mechanisms are discussed followed by the development of hypothesis. The following section covers the data collection and choice of method. Thereafter, the empirical results will be examined followed by a discussion. Finally, possible arenas for future research and managerial implications are presented.

THEORETICAL FRAMEWORK

Many taxonomies of knowledge are available in the literature. A wide-range review is offered by Nonaka and Takeuchi (1995). When measuring transfer of knowledge, the knowledge being transferred needs to be well defined. I will refer to knowledge in this study by using transfer of a specific innovation. Innovations can be viewed in terms of the knowledge they present (Kreiner and Mauritzen, 2003), moreover, innovations can be defined as technological knowledge of how to perform things better compared to the current ability (Teece, 1986). Focus of this study will be on transfer of technological knowledge in terms of a specific

innovation and the know-how and knowledge surrounding it. My definition and how the expression transfer will be used in this study are in agreement with Sulanski (1996), i.e., transfer is defined as the movement of knowledge within the organization. Knowledge flows within the integrated network of the MNC can be studied from at least three different levels (Gupta & Govindarajan, 2000). This paper examines the impact of behaviour of individual sub-units and the effectiveness of the transfer that has been undertaken to other sister-units. Earlier empirical studies have operationalized knowledge transfer by examining the degree of knowledge flows between sub-units (Haas & Hansen, 2005), and presented factors which increase or decrease the amount of knowledge in- and out-flows. However, it is not the flows in their selves that lead to knowledge exchange, but rather that the receiving sub- unit can adopt and use the specific knowledge that is being transferred. It is first after the transferred knowledge is adopted by the receiver that it can actually contribute to creativity and innovativeness (Tsai, 2002). Thus, knowledge transfer is therefore measured by relating it to transfer effectiveness, i.e., how well the receiving sub-unit has adopted the received knowledge.

Knowledge transfer barriers

I have argued that according to the knowledge-based view and the network-based view of the firm, one of the advantages of the MNC is its ability to create and transfer knowledge. However, earlier research has showed that successful transfer involves several challenges (Szulanski, 1996). One of the most recognized barriers to transfer is the tacitness and causal ambiguity of knowledge (Zander & Kogut, 1995). However, the complexity of transfer has also been highlighted in the sense that both motivational disposition and lack of absorptive capacity negatively influences knowledge flows (Levinthal & March, 1993; Szulanski, 1996). Furthermore, differences between the sender and the receiving unit in terms of culture (Kostova, 1999; Cohen & Levinthal, 1990) and technology (Zander, 1999) have proved to

impact knowledge transfer. The degree of sub-unit autonomy and sub-unit integration is also a factor that influence the transfer process (Foss & Pedersen 2002). An ongoing discussion exists as to how headquarters best should manage and foster knowledge transfer. Previous research has highlighted several factors which increase knowledge transfer. Follow, Nohria and Goshal (1994) an organizational design should be developed incorporating allocation of decision-making authority and, the use of incentives and monitoring systems. Moreover, sub-unit autonomy in terms of allocation of decision right is positively related to knowledge transfer (Goshal et al., 1998, Tsai, 2002). The integration level of the sub-unit has also showed to affect knowledge transfer, the more integrated a sub-unit is the better in terms of knowledge transfer (Foss and Pedersen, 2002), in line with this transfer is also positively affected by shared beliefs and coherence between the sub-units (O'Donnell, 2000). There has also been a string of scholars which have pointed out the significant role of communication mechanisms in order to generate knowledge transfer within the MNC (Goshal et al., 1994; Nobel & Birkinshaw, 1998; Gupta & Govindarajan, 1991, 2000 and Björkman et al., 1994).

Sub-unit motivational transfer barriers and knowledge transfer effectiveness

As stated earlier it is important for headquarters to enhance and manage knowledge transfer within the MNC in order to foster innovation capability throughout the organization. Despite, the overall positive effects of knowledge exchange and the strive from headquarters to create a rich flow of knowledge flows between it's sub-units, empirical research have presented how both sender-units and receiving-units sometimes are reluctant towards knowledge transfer. Fear of loosing its supremacy or position within the organization, or a feeling of loosing and not gaining from transfer, negatively influence the sender-unit's willingness to transfer. Hence, if the sender-unit feel it is not being rightly compensated for the cost and effort incorporated in the knowledge transfer process this also fosters reluctance towards knowledge transfer. (Szulanski, 1996 ; Forsgren et al., 2000). Moreover, the sender-unit can be negative

against transferring significant knowledge since it risks to lose some degree of its bargaining power, if the result of the transfer is a loss in uniqueness (Levitt & March, 1988; Forsgren, 1997). There are also some political aspects related to knowledge transfer, internal competition is vital for sub-unit survival and sub-units may want to keep their competitive advantage and hinder other sub-units from using it (Birkinshaw & Hood, 1998). The receiving sub-unit can also be reluctant towards receiving and adopting knowledge. The “not-invented-here” (NIH) syndrome is well established. It highlights two reasons for why sub-units may be reluctant against receiving knowledge. First, there is an ego-defences mechanism, leading to that managers’ block any knowledge coming from other units with the aim of showing that no other sub-unit possess knowledge that is more important compared to their own (Sheriff & Cantrill, 1947), second, Pfeffer (1981) highlights power struggles with the aim of downgrade knowledge coming from other sub-units.

Hypothesis

In accordance with earlier literature both reluctance against sharing knowledge with other sub-units, and reluctance towards receiving knowledge, negatively impact knowledge transfer flows within the MNC. Transferring specific knowledge such as an innovation is often a very complex process. Following Teece (1977) this process often includes the transfer of surrounding knowledge necessary to adopt and use the innovation in its new environment. For a transfer process to have any value for the receiving-unit, the received knowledge needs to be adopted and used, transfer effectiveness is of significance. Sub-units that are reluctant to transfer and do not want to give away their specific knowledge to any other sub-unit of the MNC, but despite this choose to/have to transfer may take advantage of this fact. By transferring badly i.e., they withhold the surrounding knowledge of the innovation which is vital for fully adoption and usage. Hence, the knowledge that is being transferred can not fully be adopted and used by the receiving unit, the sender sub-unit has managed to transfer knowledge but

without giving away its specific knowledge. This implies that knowledge transfer effectiveness can be very low even though knowledge transfer flows take place between sub-units. In line with this I hypothesize:

Hypothesis 1: Sender sub-unit hesitation to knowledge transfer has a negative impact on transfer effectiveness, when the sub-unit transfers knowledge to other sister units of the MNC.

It is likely that motivational barriers towards transfer held by sender sub-units and receiving sub-units will influence transfer effectiveness differently. For knowledge exchanges within the MNC to take place the sender sub-unit needs to transfer. If the sender sub-unit has very strong motivational barriers towards sharing its knowledge with other sub-units due to fear of losing their competitive advantage no transfer at all is likely to occur. However, if they go along with transfer, their hesitation towards sharing is still likely to impact the effectiveness of the knowledge transfer process negatively. If the receiving sub-unit hesitates to receive due to that the knowledge is not coming from them (NIS) this is likely to make the transfer process more complex and probably decrease transfer effectiveness even more. In the first scenario the sender sub-unit is reluctant towards sharing knowledge and may not do a good job transferring the knowledge, thus, the receiver is positive towards incoming knowledge and is likely to do their best in trying to adopt and use the knowledge. In the second scenario both the sender sub-unit and the receiver sub-unit are negative towards transfer, hence, the sender sub-unit is likely to not make an effort regarding transferring the knowledge and the receiver sub-unit is not likely to make an effort regarding adopting the knowledge. Consequently, transfer effectiveness is likely to be very low when there is hesitation to transfer both in the sender and in the receiving sub-unit. In line with this, I hypothesize that:

Hypothesis 2: Hesitation to knowledge transfer both in the sender sub-unit and in the receiving sub-unit have a more negative impact on transfer effectiveness compared to only transfer hesitation in the sender sub-unit.

Formal control mechanisms and transfer effectiveness

Despite the fact that knowledge transfer in terms of sharing and receiving knowledge within the MNC theoretically would enhance a sub-unit's performance, empirical findings have presented several motivational barriers fostering reluctance towards sharing and receiving knowledge in sub-units. Thus, most likely it will be a conflict of interest between sub-units and headquarters regarding sharing and receiving knowledge (Björkman et al., 2004) when motivational transfer barriers are present. According to Gupta and Govindarajan, (2000) the elimination of these motivational barriers counterbalance "any hoarding tendencies and thereby have a positive impact on the magnitude of knowledge outflows". In order to eliminate this barrier headquarters can, as earlier described, introduce different mechanisms. One of them is formal demand. Previous research has showed how formal mechanism has proven to increase the amount of knowledge outflows. that formal demand to transfer not only affect transfer outflows positively but also impact positively on knowledge transfer effectiveness, i.e., how well the receiving unit adopt the transferred knowledge.

Hypothesis 3a: Formal demand from headquarters to transfer knowledge to other sub-units of the organization has a positive affect on transfer effectiveness.

In a contrary line of reasoning, I also argue that headquarters formal demand concerning transfer of knowledge can have a negative impact on transfer effectiveness. The reluctant feelings of the sub-unit towards sharing knowledge need not to disappear because headquarters demands it. It is likely that the degree of transfer flows will increase as a

response to headquarters demands both in terms of cost and time i.e., efficiency. However, looking at transfer efficiency in terms of how well the receiving sub-unit adopts and use the receiving knowledge this process may very well be negatively affected by formal demand from headquarters. One can assume that if the sending sub-unit is afraid of loosing its competitive advantage but still has to transfer the innovation, they have a incitement to transfer poorly in terms of transfer performance, and will do so with the aim to transfer as demanded but no to the degree that the receiving sub-unit will be able to fully use the transferred knowledge. Likewise, a sub-unit that is described to receive knowledge may choose to receive it as demanded but not to use it. Follow, Kostova and Roth (2002) this behavior has been described as ceremonial. Previous research has also showed how authority and fiat in organizations may cause ill-feelings between subordinates (Goshal & Moran, 1996). Accordingly, formal demand to transfer may not only have a negative impact on knowledge transfer flows it is also likely to impact knowledge transfer effectiveness negatively.

Hypothesis 3b: Formal demand from headquarters to transfer knowledge to other sub-units of the organization has a negative affect on transfer performance.

Which criteria headquarters use to evaluate sub-unit or sub-unit manager's performance is most likely to affect what sub-unit manager emphasizes and priorities (O'Donnell, 2000). The basic logic being that if subsidiary managers can see a direct connection between their operational emphasizes and how this affect their evaluation score, factors incorporated in the evaluation program are likely to be prioritized. The score of evaluation systems often serve as a base for resource, mandate and bonuses allocation. Hence, it is of significance for sub-units and sub-unit managers that their scores fall out well. Consequently, factors incorporated in formal evaluation systems are likely to be emphasized by sub-unit managers. Empirical

studies on the formal control mechanism of bonus and incentive systems and their influence on transfer flows have showed mixed results. The hypothesised positive relationship between knowledge outflows and the degree to which a subsidiary manager's bonus is related to network performance instead of subsidiary performance was not supported in the study of Gupta and Govindarajan (2000). However, Björkman et al., (2004) finds statistical empirical support for their argument that if the incentives system implemented by headquarters for a subsidiary manager is not only connected to his or her performance but additionally also linked to how other subsidiary top managers are compensated, this increases the knowledge-sharing behaviour of the subsidiary.

Even though different results has been indicated considering the role of bonus systems on knowledge outflows more research is needed to confirm how it affects knowledge transfer effectiveness. The positive relationship between incentive systems and transfer flows presented in Björkman et al., (2004) opens up for the discussion which role formal systems implemented by headquarters in order to control knowledge flows plays regarding knowledge transfer effectiveness. Drawing upon the findings in Björkman et al., (2004) it is possible that evaluation systems which serve as a base for future sub-unit or sub-unit manager allocation of resources, mandate or financial bonuses and which is related to transfer influences transfer effectiveness positively. In line with this I hypothesize:

Hypothesis 4 – Formal evaluation systems related to transfer positively affects knowledge transfer effectiveness.

DATA AND DATA OUTCOMES

Research process

The data used in the study was collected during 2000-2005. In collecting the data, large corporations active on the international arena which likely undertook technology generating and transfer activities were approached. The sub-units from which the sample is derived are to very high degree international, constituting representations from 14 countries spread out over Europe, Australia, Asia and the US. The observed sub-units are operating in a variety of businesses such as manufacturing, telecommunications, power systems, retailing, transportation and chemistry. Concerning the size of the subsidiaries, the actual number of employees differs from 9 to approximately 6000 indicating a well distributed sample.

The data was collected through face-to-face interviews with subsidiary managers at a high-level, using snowball sampling. Previous to the interview the respondents were briefed in the aim of the study, and had their anonymity guaranteed. The used language of all interviews was English, the aim for this was to reduce bias. There was a large variation in country representations, however all of the respondents were fluent in English. Managers were chosen primarily because their understandings of the situation make them the most suited to answer the perceptual questions covered in this study. Each interview was recorded and lasted around 1-3 hours. There is always a risk of unsystematic bias when performing face-to-face interviews and even though this approach can be seen as a hybrid, it still suffers from the same potential hazard. It is difficult studying relationships and complex contexts alike, having to depend on subjective interpretations and reflections. Nevertheless, the face-to-face approach includes important benefits such as obtaining a deeper understanding of the problem at hand and the ability to reach the exact wanted respondent. Several 7-point likert scales were used to obtain data on technological characteristics, as recommended by Cox (1980).

OPERATIONALIZATION OF THE VARIABLES

Dependent variable

Knowledge transfer effectiveness – A construct comprising three indicators was used to derive the for my model dependent variable, knowledge transfer effectiveness. Transfer effectiveness was measured by examining to what extent the innovation transfer was completed and how the innovation was adopted by the receiving sub-unit. To control for this the respondents were asked to initially evaluate the following questions *<Level of completed innovation transfer>* on a scale ranging from 1 (totally disagree) to 7 (totally agree), followed by *<The counterpart adopted the innovation very quickly>*, and finally *<The innovation has been very easy to adopt by this counterpart>*. Second, the factors were examined in a factor analysis (principal component with Varimax rotation and Kaiser normalization). To control for the appropriateness of factor analysis the Kaiser-Meyer-Olkin measure of sampling adequacy was used, which surpassed the acceptable level (0,6) with an overall value of 0,659. Third, the indicators were added up and divided by two to form the scale and the measurement used when running the analysis. Internal reliability of the scale was acceptable (Cronbach alpha = 0,759)

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Independent variables

Transfer hesitation sender-unit – Motivational barriers to knowledge transfer in sender sub-units are according to the literature often fostered by a fear of losing an advantage or position within the MNC (Szulanski, 1996 ; Forsgren et al., 2000). To control for this the respondents were asked to evaluate on a scale ranging from 1 (totally disagree) to 7 (totally agree) the following statement, *<With regard to the transfer of the innovation: you hesitate to transfer the innovation as you will lose your advantage within the MNC>*.

Transfer hesitation barrier – Previous studies have showed how hesitation to knowledge transfer exists both in the sender and in the receiving sub-unit. Receiving sub-units can be unwilling to adopt transferred knowledge (Cohen & Levinthal, 1990; Szulanski, 1996), and sender-units can be reluctant towards sharing knowledge. The aim of this variable is to create an aggregated measurement of transfer hesitation, capturing hesitation both in the sender and the receiving unit. A construct was formed using two indicators, one representing knowledge transfer hesitation in the sender-unit and the other capturing knowledge receiving hesitation in the receiver-unit, hence providing a general measure of transfer hesitation. The respondents were again asked to evaluate on a scale ranging from 1 (totally disagree) to 7 (totally agree) the two following statements, *<With regard to the transfer of the innovation: you hesitate to transfer the innovation as you will loose your advantage within the MNC>* and secondly *<With regard to the transfer of the innovation: the counterpart hesitates to receive the innovation as it was not invented by them>*. The indicators were summed and averaged to form the construct (coefficient alpha: 0,552).

Formal demand to transfer –This variable should reflect headquarters efforts concerning fostering knowledge transfer, by examining how formal demand from headquarters to transfer affects transfer performance. The respondents were asked to evaluate the following question by stating their agreement from 1 (totally disagree) to 7 (totally agree). *<With regard to transfer of the innovation, to what extent is it driven by the following factor: requirement from headquarters>*, and *<With regard to transfer of the innovation, the divisional headquarters has formally instructed you to share this innovation with the counterpart>*. The indicators were summed up and averaged to constitute a construct (coefficient alpha 0.642).

Evaluation system – was operationalized by a asking the respondents to evaluate the following statement *<With regard to transfer of the innovation, to what extent is this driven*

by the following factor: *headquarters evaluation system*> Again, respondents contributed by stating their agreement from 1 (totally disagree) to 7 (totally agree).

Control variables

With the aim to reduce unobserved heterogeneity, six control variables were inserted in the model. All which are presented and discussed below.

Tacitness – It has been argued that the more complex knowledge in terms of context specific and tacitness the more difficult it is to transfer, due to limitations to origin country or domain of operation (Szulanski, 1996). In order to control for non-tacitness likely to make the transfer process easier, two indicators were used to form a construct. The respondents were asked to evaluate the following statements <The innovation technology/process know-how is easily codifiable (in blueprints, instructions, formulas, etc. > and secondly <The innovation/technology process know-how is more explicit (i.e., easily transferable) than tacit> on a scale ranging from 1 (totally disagree) to 7 (totally agree). The two indicators were summed up and averaged to constitute a construct intending to capture non-tacitness (coefficient alpha: 0,661).

Collaborative experience –Interaction between two actors is an important factor which often fosters a relationship incorporating trust, norms and identification (Inkpen & Tsang, 2005). The existence of close relationships between sub-units has showed to be positively linked to knowledge transfer (Tsai & Goshal, 1998). To control for this the respondents were asked to evaluate the following three statements: <*To what extend you had previously (beside this innovation) cooperated and shared knowledge together with the following counterparts regarding;(1) level of previous cooperation, and (2)level of knowledge shared*> and by

asking, *<With regard to the transfer of the innovation, to what extent is this driven by the following factor: existing routines of sharing knowledge with this counterpart>* Again, the respondents contributed by stating their agreement from 1 (totally disagree) to 7 (totally agree). The indicators were summed up and averaged to form a construct (coefficient alpha: 0,730).

Sub-unit similarity - Previous empirical research have showed how technological (Zander, 1999), cultural (Kostova, 1999), and geographical differences between the sending-unit and the receiving-unit impact knowledge transfer. To control for similarity between the sender and the receiving sub-units the respondents were asked to answer *<With regard to transfer of the innovation, evaluate the following statement: Organizational similarity makes transfer unproblematic>*. Again, the respondents contributed by stating their agreement from 1 (totally disagree) to 7 (totally agree).

Sub-unit size – Earlier studies have showed how subsidiary size affects knowledge transfer within the MNC (Foss & Pedersen, 2002). It was therefore controlled for by measuring the number of employees. The respondents were asked to assess *<What is the number of employees of the unit>*. This variable was then log to.

Subsidiary age – Knowledge transfer is a complex process, it does not take place on a routine basis (Gupta & Govindarajan, 2000). Actors which have done this repeated times are more likely to have routines and knowledge about the transfer process, thus, age and experience of transfer are likely to positively affect knowledge transfer. To measure this, the respondents were asked to state *<What is the unit's age within the MNC>*. The measure of age within the MNC was chosen since the study measures transfer performance within the MNC,

subsequently, transfer activities that might have been done earlier are not included in the research focus.

Sub-unit roles - In order to control for the characteristics of the sub-unit, I added two covariates in the form of dummy variables to reflect the functional area of the sub-unit. Both dummies were coded 0 1. The respondents were asked to tick the box of which it had a formal activity in regarding <Sales> and <Research>. The logic behind these dummies is that the nature of subsidiary operations (Gupta & Govindarajan, 2000) is expected to shape the nature of knowledge flows within the MNC.

****INSERT TABLE 1 AROUND HERE****

DATA ANALYSIS

The data used in the study was collected through a single channel, which can cause a potential concern that an overall positive affect variable would produce a common method bias in the study. In order to control for this, the items used in the study were spread out in the questionnaire with the aim to limit the possibility of respondents rationalizing answers. To control for potential multicollinearity, the variance inflation factor (VIF) was calculated. The present calculated VIF values indicate no multicollinearity, i.e., there is no interference between the independent variables, and it will therefore not be a problem interpreting the results from the regressions. Hence, the highest value was below 3, with a normal cut-off point around 10 (Studenmund, 1992; Marquart, 1970).

There have been no corrections in terms of outliers. The logic behind this is that the sample represents a one-hundred percent response activity, compared to sent out questionnaires,

hence it would therefore be unfair to single out selected parts of the data population by excluding unfavorable items.

DATA OUTCOMES AND INTERPRETATIONS

Table 2 reports the models aiming at explaining the impact of motivational barriers and formal control mechanisms on knowledge transfer effectiveness. Five different models were estimated by using Ordinary Least Squares (OLS) regressions. Initially only the control variables are entered, second, in model 2 and 3 the independent variables of transfer hesitation are inserted. Finally, in model 4 and 5 the independent variables testing which affect formal control mechanisms have on transfer performance are entered. Model 1 only examines the control variables. It shows various sub-unit characteristics and roles used as controls in the regression. Only one control variable showed significant coefficient; sub-unit similarity. Overall model 1 is significant with an F-value of 3.191 ($p < 0.01$). Approximately 10 percent of the variance in the dependent variable was explained.

****INSERT TABLE 2 AROUND HERE****

Motivational barriers and transfer effectiveness

In the context of motivational barriers, I operationalized it by looking at transfer hesitation in the sender-unit, and by looking at hesitation both in the sender- and in the receiving sub-unit. Model 2 examines the control variables, along with the independent variable sender hesitation, and model 3 examines the control variables together with the independent variable hesitation barrier (aggregated hesitation, both in the sender- and receiving sub-unit). The results indicate support for both of the resulting hypotheses. More specifically, knowledge transfer effectiveness, i.e., adoption of transferred knowledge by the receiving sub-unit is negatively influenced by hesitation to transfer in the sender sub-unit (beta for “sender

hesitation” = -0,204, $p < 0,05$, thus, H1 is supported). The negative impact on knowledge transfer effectiveness is even higher when there is hesitation to knowledge transfer both in the sender and in the receiving sub-unit (beta for “hesitation barrier” = -3,543, $p < 0.001$; thus, H2 is supported).

The amount of explained variance in model 2 increases from 10 percent to about 13 percent. Model 2 is significant overall with an F-value of 3.397, $p < 0.001$. The amount of explained variance in model 3 increases from 10 percent to approximately 21 percent, the model is significant overall with an F-value of 5.251, $p < 0.001$.

Formal control mechanisms and transfer effectiveness

Table 2 presents my results of regression analysis to test the hypothesis regarding the impact of formal control mechanism on knowledge transfer effectiveness. The two formal control mechanisms tested were, formal demand to transfer from headquarters, and evaluation systems related to transfer. In the context of formal demand from headquarters to transfer I operationalized this construct in terms of if the transfer process was driven by the requirement from headquarters to transfer, and if the divisional headquarters formally had instructed the sub-unit to share their knowledge. The result in model 4 and 5, with regard to the control mechanism of formal demand support hypothesis 3b, hence, formal demand to transfer required by headquarters have a negative impact on knowledge transfer effectiveness, both when there is hesitation to transfer in the sender sub-unit, as showed in model 4, but also when there is hesitation to transfer in both the sender and the receiving sub-unit, as presented in model 5. More specifically, the formal control mechanism, requirement to transfer, have a higher degree of negative impact on knowledge transfer effectiveness when there is only transfer hesitation in the sender sub-unit (beta for formal demand to transfer in model 4 = -0.438, $p < 0.01$, thus hypothesis 3a is supported) however, the influence of the mechanism on

knowledge transfer effectiveness is still negative when there is hesitation in both the sender- and the receiving sub-unit (beta for formal demand to transfer in model 5=-0.398,p 0.01). Regarding the formal control mechanism, evaluation systems related to transfer, the results indicate a positive influence on knowledge transfer performance. Formal evaluation system was operationalized by asking the respondents if the transfer process was driven by an evaluation system. Hypothesis 4 is supported in model 4, thus, formal evaluation system related to transfer positively affects knowledge transfer effectiveness when there is transfer hesitation in the sender-unit (beta=0,281, $p<0,5$). Turning to model 5, no statistical significant influence is found. Hence, formal evaluation systems related to transfer has a small positive not significant impact on knowledge transfer effectiveness when there is transfer hesitation both in the sender- and in the receiving sub-unit (beta=0.18, thus hypothesis 4 is not supported). Overall, model 4 is significant with an F-value of 2.434 ($p<0.01$), and model 5 is significant with an F-value of 2.912 ($p<0.01$).

DISCUSSION

The results found in this study indicate robust support for that sub-unit hesitation regarding knowledge transfer and receiving of knowledge influences knowledge transfer effectiveness negatively. Furthermore, it also indicates solid support that formal control mechanism implemented by headquarters to manage the knowledge transfer process has both negative and positive affects on knowledge transfer effectiveness. While previous studies have focused on knowledge flows and factors which decrease or increase the amount of knowledge exchange flows, this paper has advanced and contributed to the literature by examining transfer effectiveness, i.e., to what extend motivational barriers and formal control mechanisms influence the adoption of the transferred knowledge in the receiving sub-unit. Further, unlike previous studies on motivational barriers concerning knowledge transfer this paper examines both the effect of hesitation in sender-units but also the aggregated effect of

hesitation in both sender and receiving units. The result presented show how perceived hesitation in both the sender and in the receiver sub-unit decreases knowledge transfer effectiveness to a higher degree compared to only hesitation in the sender-unit. Thus, when trying to overcome hesitation barrier managers need to address both the sender and the receiving sub-unit.

A vital issue for headquarters is how to best manage and foster knowledge transfer within the organization, in doing so they need to use organizational mechanisms as tools for overcoming transfer barriers. Previous literature have presented several organizational mechanisms and how they impact on knowledge flows, looking at the two empirical observations presented in this paper on how formal control mechanisms impact knowledge transfer effectiveness, two opposite effects are found. Formal demand to transfer from headquarters shows statistical significant results indicating that it influences knowledge transfer effectiveness in a negative way, both when there is hesitation in the sender sub-unit, and also when the sending and the receiving sub-units hesitate to share and receive knowledge. On the contrary, formal evaluation systems which are related to transfer influences knowledge transfer effectiveness positively. This highlights the power of formal control mechanisms but also that they need to be used with caution, a formal control mechanism such as formal demand to transfer, which has the aim of improving knowledge transfer adoption, has the exact opposite effect, hence, it increases the degree of knowledge transfer effectiveness. However, the results indicate that evaluation systems related to transfer has the wished influence regarding adoption of the transferred knowledge in the receiving sub-unit, thus, the degree of knowledge transfer effectiveness increases. This is an interesting finding, showing that headquarters can introduce formal control mechanisms, and in doing so increase the level of knowledge transfer effectiveness. Earlier literature has contributed by showing how organizational mechanisms can influence knowledge transfer flows positively, the result found in this paper

shows how formal control mechanisms also can be used in order to enhance knowledge transfer effectiveness.

Even though this paper contributes in several aspects, there are certain limitations with the study that needs to be brought up. Above all, if it had been possible it would have been preferable to use data also from the receiving sub-units. By using data from sub-units that received knowledge the risk of individual biases would have decreased and the quality of the data would be increased. Moreover, data from receiving sub-units could also have the ability of increasing the precision of the measurement. The data sample of MNC in the current study is not representative for the whole population of MNC worldwide. All of the MNC in the sample are large firms with a solid history of multinational business activity in a variety of production industries. Thus, the findings are not applicable to other industries or smaller international firms such as “born globals”.

CONCLUSIONS

The aim of this paper was to observe how motivational barriers in sub-units and how efforts to foster transfer by headquarters influences transfer effectiveness. The key findings suggest that hesitation to transfer and receive knowledge in sub-units, influences knowledge transfer effectiveness negatively, and that formal control mechanisms introduced by headquarters differ in their impact on knowledge transfer effectiveness. Formal demand to transfer influence negatively and a formal evaluation system related to transfer impacts positively on knowledge transfer effectiveness. The empirical findings in this paper have both managerial and theoretical implications. Knowledge transfer is vital between sub-units of the MNC in order to create innovativeness, for this to occur managers need to foster and manage the knowledge transfer process. Thus, it is of significance for managers to consider that hesitation perceived by sub-units is a factor which negatively influences knowledge performance.

Moreover, the interesting result indicating how formal control mechanisms affect knowledge transfer effectiveness differently gives important insights regarding what organizational mechanism to use and how important the choice of organizational mechanisms is, in order to foster knowledge transfer effectiveness and overcoming transfer barriers. This paper hopes to contribute to the theoretical discussion by providing significant indications showing that when motivational barriers are perceived both in the sender and in the receiving sub-unit the negative influence on knowledge transfer effectiveness increases. Moreover, this study contributes by adding to the current literature that motivational barrier do not only affect knowledge transfer flows negatively, is also influences knowledge transfer performance negatively. Regarding the influence of formal control mechanism, it contributes by showing that they do impact on knowledge transfer effectiveness, and that formal control mechanisms by headquarters affect knowledge transfer effectiveness differently, thus highlighting the need for more research on which influence formal control mechanisms have on knowledge transfer effectiveness.

Even though the present study offers some initial empirical indications on how motivational barriers in terms of hesitation, influences knowledge transfer effectiveness, more research is needed. The intention of this study was not to develop a conceptual model on what creates knowledge transfer effectiveness, rather the focus was to highlight what effect hesitation barriers and formal mechanisms has on knowledge transfer effectiveness. Moreover, it only investigated technological knowledge transfer. Even though data limitations prevented measurement of the influence of hesitation transfer barriers, and formal control transfer mechanisms on sub-unit performance in terms of innovation generating output, I believe they offer interesting opportunities for future research. First, further research is needed on the actual influence of knowledge transfer between sub-units, in terms of sub-unit performance, innovation capability and output. Second, more research is needed which focuses on transfer

effectiveness and how well the transferred knowledge is adopted by the receiver. Finally, future research needs to further develop if formal control mechanisms introduced by headquarters might work as a mediate factor when motivational barriers are present in sub-units of the MNC, and what formal mechanisms should be used in order to dampen or eliminate the negative influence of motivational barriers on knowledge transfer effectiveness.

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Table 2:

Table 2 Result of Analysis for Knowledge Transfer Effectiveness (standardized parameter estimates)					
<u>Variables</u>	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>	<u>Model 5</u>
Intercept	2,786***	3,095***	3,543***	3,869***	3,891***
Sender hesitation		0,204*		-0,315*	
Hesitation barrier			-0,346***		-0,264*
Formal demand				-0,438**	-0,398**
Evaluation system				0,281*	0,18
Tacitness	0,71	0,106	0,106	0,101	0,065
Collaboration exp.	0,013	-0,5	-0,9	0,301*	-0,282*
Sub-unit similarity	0,316***	0,285***	0,238**	0,286*	0,326**
Sub-unit size	0,112	0,131	0,174	0,331*	0,386*
Sub-unit age	0,028	0,041	0,052	0,247 [†]	0,260*
Sub-unit research	0,129	0,195□	0,235**	0,113	0,072
Su-unit sales	-0,106	-0,07	-0,009	-0,145	-0,178
R2	0,151	0,18	0,256	0,255	0,297
R2 adjusted	0,103	0,127	0,207	0,15	0,195
F-statistics	3,191***	3,397***	5,251***	2,434**	2,912**

Knowledge transfer effectiveness is the dependent variable.

* $p < .05$; ** $p < .01$; *** $p < .001$

n=80

Table 1:

	Min	Max	Mean	St. dev	1	2	3	4	5	6	7	8	9	10	11
Transfer effectiveness	1	7	5,276	1,362											
(1)Sender hesitation	1	7	1,458	1,229	-0,064										
(2)Hesitation barrier	1	7	1,882	1,361	-0,334**	0,635**									
(3)Formal demand	1	7	3,384	2,211	-0,208	0,180	0,209								
(4) Evaluation syst.	1	7	2,461	1,964	-0,153	0,278*	-0,002	0,467**							
(5)Tacitness	1	7	5,474	1,545	0,142	-0,142	-0,114	-0,059	0,237*						
(6) Collaborat. exp.	1	7	4,702	1,61	-0,015	-0,306**	-0,321**	0,101	0,302**	0,056					
(7)Sub-unit similarity	1	7	5,581	1,705	0,358**	-0,196	-0,349**	-0,182	-0,082	-0,036	0,234*				
(8)Sub-unit size	2,08	8,69	5,414	1,59	0,052	0,369**	0,391**	0,354**	0,098	0,100	-0,107	-0,143			
(9)Sub-unit age	2	100	20,689	19,131	-0,073	0,063	0,063	0,517**	0,224*	-0,092	0,342**	-0,206	0,180		
(10)Research	0	1	0,555	0,498	0,218	0,269*	0,140	0,033	-0,011	-0,086	0,059	0,182	0,240*	0,069	
(11)Sales	0	1	0,526	0,501	-0,090	0,084	0,214	0,020	0,006	-0,119	-0,182	0,042	0,328**	-0,071	-0,507**

