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Internal Versus External Knowledge  
Sourcing Of Subsidiaries  
– An Organizational Trade-Off

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# **INTERNAL VERSUS EXTERNAL KNOWLEDGE SOURCING OF SUBSIDIARIES - AN ORGANIZATIONAL TRADE-OFF**

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## **Abstract**

When building up competences, a subsidiary of a multinational corporation (MNC) may rely on external knowledge sources like customers, suppliers, competitors or local science centers. Internal sourcing is also available through knowledge offered by headquarters or other affiliates. The question is whether the two kinds of sources are mutual exclusive. A dilemma or organizational trade-off is foreseeable, since the more the subsidiary adapts its knowledge creation processes to host country institutions, the less it will be able to utilize internal knowledge sources due to the institutional distance between the external and internal networks. However, newer organizational forms, like the concept of the “differentiated MNC”, imply a relatively smooth flow of knowledge inside the MNC, indicating that we should not expect an organizational trade-off between internal and external sources. The subsidiary’s ability to build on two knowledge networks depends on its scale of resources, absorptive capacity and the role it plays in the corporation.

The relationship between internal and external sourcing is tested using a unique dataset that covers more than 2,000 subsidiaries located in seven different European countries (the Centre of Excellence Project). In fact, the results show that, to a certain extent, there is no dilemma between a subsidiary’s knowledge development based on both internal, and external knowledge sources. However, the results also show a bell-shaped relationship between the use of internal and external sources, where a heavily embedded use of internal sources excludes the use of external sources.

**Keywords:** Internal sourcing, External sourcing, Institutional Isomorphism and Subsidiary knowledge.

## INTRODUCTION

MNCs are no longer seen as repositories of their national imprint, but as instruments whereby knowledge is transferred across subsidiaries, contributing to knowledge development (Holm and Pedersen, 2000). A common theme in this line of research is that MNCs can develop knowledge in one location but exploit it in other locations, implying an internal transfer of knowledge. Value creation stems from leveraging internal flows of knowledge embedded in local clusters (Porter, 1990; Cantwell, 2001; Mudambi, 2002). Often, this kind of knowledge is only accessible through subsidiaries. In such situations, knowledge transfers go from the external network via the subsidiary to headquarters or other affiliates. The subsidiary plays a “gatekeeper” role (Katz & Tushman, 1983), or acts as a listening post (Vernon, 1979; Miller, 1994; Chiesa, 2000), through which absorption, translation and transfer of knowledge makes externally embedded knowledge useful to inside receivers. Thus, the competitive advantage that MNCs enjoy is contingent upon their ability to facilitate and manage inter-subsidiary knowledge transfers (Kogut & Zander, 1992; Almeida et al., 2002). Different advanced organizational forms, like the “transnational firm” (Bartlett & Ghoshal, 1989), the heterarchy (Hedlund, 1986) or the differentiated network (Nohria & Ghoshal, 1997), have been suggested as effective in facilitating the flow of knowledge inside the MNC. These advanced multinational forms point subsidiaries responsible for competence creation. In order to provide the MNC with unique, rare and inimitable knowledge (Barney, 1991), autonomy and external embeddedness are emphasized. The subsidiary needs to establish intense relationships with its local counterparts and design its knowledge creation process to meet local cognitive institutional pillars (Scott, 1995). The question is whether the subsidiary is simultaneously able to utilize internal knowledge sources, or whether internal knowledge is combinable with knowledge supplied by a host country science centre. The degree of context specificity complicates the amalgam of different knowledge sources. The trade-off lies in the extent to which the subsidiary’s external market environment and its corporate environment have separated (or integrated) systems in terms of connections between resources, activities, and knowledge development.

The purpose of this study is to discuss the concepts of internal and external sourcing and extent to which an organizational trade-off exists between these seemingly conflicting forces. The concept of advanced MNC forms implies a relatively smooth flow of knowledge inside the MNC, indicating that we should not expect an organizational trade-off between internal and external sources, whereas

the institutional theory, based on dissimilarity between MNC institutions and the local institutions of the subsidiary, advocates a conflict arising from internal and external embeddedness in utilizing knowledge sources.

Our empirical findings show that the trade-off only exists to a certain degree, and subsidiaries simultaneously build competences upon dual sources. Internal and external sources, therefore, are not mutually exclusive, and subsidiaries are able to cope with the conflicting forces, as proposed by Howells (1993), and Blanc & Sierra (1999). However, heavily internally embedded subsidiaries rely on external sources to a lesser degree.

In the following sections, we first discuss factors leading to a trade-off, a discussion from which a hypothesis is derived. The counterargument is then presented leading to a contradicting hypothesis. A third hypothesis suggests a bell-shaped relationship between the two kinds of sources. A range of control variables is also discussed. Our sample is then presented, and methods and constructs are discussed. Subsequently, the statistical results are presented, before conclusions are drawn.

## **The Dual Knowledge Sources of Subsidiaries**

The subsidiary's relationships to counterparts in the local host environment are of particular importance for its daily business activities e.g., production, sales activities and knowledge creation processes (Blanc & Sierra, 1999; McEvily & Zaheer, 1999; Andersson et al, 2002; Frost et al., 2002). To build up strong positions in external networks, these activities must correspond to the *institutional* requirements of the local host environment. A concept covering this situation of homogenization, where one unit in a population resembles the other units facing the same institutional conditions, is isomorphism (Hawley, 1968; DiMaggio & Powell, 1983; Rosenzweigh & Singh, 1991). Building on Scott's (1995) terminology, the subsidiary must be subject to local regulations and, in a wider context, not come across norms and values that might destroy legitimacy (Kostova & Zaheer, 1999). This coercive isomorphism stems from political influence that puts pressure from the counterparts on the subsidiary (DiMaggio & Powell, 1983).

Simultaneously, the MNC has its own institution with rules, norms, values and cognitive pillars from which to act. When fulfilling the demands of external institutions, the subsidiary must form internal

relationships and share social context with its headquarters and other subsidiaries. Subsidiaries, therefore, exist in a world of institutional duality (Kostova & Roth, 2002), caught between the MNC institutions and the local institutions. A distance between the two institutions is predictable. These cross-national/community dissimilarities in institutional structures lead to differences in management practices (Gooderham et al.; 1999; Kostova & Roth, 2002). Subsidiaries typically overcome this distance, or liability of foreignness, by imitating local practices (Zaheer, 1995). This is a long-lasting replication, not only related to market entrance (Sethi & Guisinger, 2002), although, adaptation to local institutions might be a crucial factor for survival (Hennart et al., 2002). The institutional distance between the internal and external sources complicates simultaneous utilization, as the subsidiary must adapt to the same cognitive context as the local knowledge transmitter in order to absorb knowledge from the network, (Krippendorff, 1975; Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Blanc & Sierra, 1999; Cowan et al. 2000; Alavi & Leidner, 2001), as in the case of minimizing psychic distances to the customer (Johanson & Vahlne, 1977).

A second problem relates to the degree of context specificity. Often, even if the knowledge is codified, articulated and stored in the organizational memory, a substantial distance exists between the informant who encodes data and the organization or person who needs to decode it (Krippendorff, 1975). This decontextualization is an outcome of particularity in a relationship, as expressed by the uniqueness of information transferred in a dyadic relationship (Ford et al., 1986). If a unique context is structured with the purpose of conducting business transactions, knowledge transfers become specific and contextually embedded rather than standardized. The adaptation-process taking place between the subsidiary and its local partners further leads to context-specificity. Adaptations reflect a unilateral or mutual adjustment of attitudes, strategies, knowledge, and knowledge transfer mechanisms in the network, manifested in modified products and processes (Forsgren et al., 1995). The question is whether the subsidiary is able to manage these adaptation processes in both an internal and external context. One example is the wide discrepancy between the product-oriented knowledge creation, taking place in in-house R&D, and the basic research oriented chosen for investigations in such institutions as universities (Rynes et al., 2001).

This dilemma is partially solved if headquarters offers needed resources to the subsidiary. However, organizations typically do not have equal capacities to build close relationships with all “partners”

(Lane & Lubatkin, 1998), especially if the aim of the relationships is to reach particularity, stability, and strategic fit to the counterpart (Andersson et al., 2002). The above argumentation leads to the following hypothesis:

*Hypothesis 1: The more the subsidiary uses internal knowledge sources for knowledge development, the less it will use external knowledge sources for the same purpose.*

The concept of the “differentiated MNC” implies a relatively smooth flow of knowledge inside the MNC, indicating that we should not expect an organizational trade-off between internal and external sourcing. Furthermore, a common understanding in recent literature on the development of multinational corporations (MNCs) and headquarters-subsidary relations is that some subsidiaries will have, or ought to have, a strategic role in the global organization that reaches beyond their local undertakings (Bartlett & Ghoshal, 1989; Gupta & Govindarajan, 1994). This strategic role is to maintain one or several critical fields of knowledge that have a long-term impact on the development of activities conducted by other MNC units. The external relationships strengthen knowledge creation processes and help the subsidiary become recognizable to other MNC units (Frost et al., 2002), which again helps the subsidiary to differentiate its position in the MNC from other subsidiaries (Birkinshaw, 1996). The recent studies by Andersson & Forsgren (2000) and Andersson et al. (2002) show that external, technology-oriented relationships have a positive impact on the subsidiary’s influence in the MNCs product program and production processes. To be investigated is whether these positions strengthened via external relationships help the subsidiary to utilize internal sources as well. First, headquarters and other affiliates recognize the existence and relevance resource, and knowledge transfer to the particular subsidiary, as expressed in the center of excellence definition (Holm & Pedersen, 2000). Secondly, through external sources, the subsidiary builds up absorptive capacity. As Cohen & Levinthal (1990) write, the firm’s ability to identify, assimilate, and exploit knowledge from the environment depends on the stock of prior knowledge. We assume that the knowledge stock is continually improved by forming relationships with various internal and external sources, thereby advocating a self-increasing process of absorptive capacity building. The combinative capabilities of the firm come into play here (Kogut & Zander, 1992; Bosch et al., 1999). The discussion leads towards a concept of subsidiaries acting as centers of excellence, as Frost et al., (2002) declare entities that simultaneously depend on external sources



(in the form of clusters and particular units of competence) as well as inter-unit relationships (in the form of autonomous-oriented units possessing competence). This line of argumentation leads to hypothesis 2:

*Hypothesis 2: The more the subsidiary uses internal knowledge sources for knowledge development, the more it will use external knowledge sources for the same purpose.*

Basically, hypotheses 1 and 2 imply the following model:

$$\text{Internal sourcing} = \text{External sourcing} + \text{Controls}$$

where the level of internal sourcing is determined by the level of external sourcing. Hypothesis 1 advocates a negative significant relationship (the conflict) while hypothesis 2 advocates a positive significant relationship (the balanced sourcing).

Further, we intend to operate with a bell-shaped relationship between internal and external sources, not seeing the relationships as an either-or straightforward solution. Up to a certain degree, a subsidiary is able to draw on both external and internal sources, because resource constraints are not foreseeable before the subsidiary starts relying heavily on one source. A similar effect is seen with regard to institutional obstacles, since only high degrees of embeddedness will cause troubles. In daily life, subsidiaries all over the world handle this “institutional duality” (Kostova & Roth, 2002), and we believe only deep and long-lasting dyadic relationships causing particular adaptation processes lead to exclusion of other knowledge sources. The third hypothesis tested is:

*H3: There is a bell-shaped relationship between the use of internal and external sources for knowledge development in subsidiaries.*

Basically, hypothesis 3 implies the following model:

$$\text{Internal sourcing} = \text{External sourcing} + \text{External Sourcing}^2 + \text{Controls}$$

## Controls

A review of the literature on “subsidiary network” identifies a number of variables having an impact on the degree of knowledge sourcing of subsidiaries. One of these factors is the level of resource dependency and the need to tap into other sources (Pfeffer & Salancik, 1978). Furthermore, the subsidiary in an advantageous position, such as a centre of excellence, makes other units dependent on resources possessed by the subsidiary. This gives an incentive for other corporate units not only to source, but also to transfer knowledge that can be improved by the subsidiary and returned in modified form (Gammelgaard, 2002).

Autonomous based subsidiaries typically rely on external relationship, and a less attention towards internal relationship is predictable. Autonomy helps the subsidiary to build up unique and distinguishable knowledge positions by tapping into external networks not accessed by other entities in the MNC. Some studies show a positive relationship between subsidiary autonomy and knowledge creation (Taggart 1997; Taggart and Hood 1999). However, opposite results are found by Brockhoff and Schmaul (1996) and Ensign et al. (2000). The autonomous subsidiary is in a difficult position, since it may experience a loss of bargaining power when transferring knowledge, whereas isolation might lead to knowledge hoarding (Szulanski 1995; Husted and Michailova, 2002). Further, Not Invented Here syndrome is likely caused by the isolation effect (Katz & Tushman, 1983).

Interchanges of products and resources with corporate entities are an inverse operation to autonomy (Garnier, 1982), and are important for internal embeddedness and integration in the MNC. Randøy and Li (1998) show a positive relationship between the flow of physical products and MNC integration. Both Randøy and Li (1998), and Gupta and Govindaran (1994, 2000) advocate specific subsidiary roles to handle both inflows and outflows of products and resources.

The establishment form affects the degrees of external and internal sourcing respectively. A greenfield establishment is closely related to headquarters, acts as a sort of replica, and internal sourcing is initially high. Over time, a higher degree of independence develops, in terms of overcoming liability of foreignness problems, and starting up customization processes. The reverse entry mode is the acquisition of a foreign firm. The new subsidiary will be internally distant at the time of take-over, but will, over time, be integrated (Rosenzweig and Singh, 1991; Håkanson & Nobel, 2001). Integration, though, depends on the strategy chosen in terms of dedication of strategic resources (Haspeslagh and Jemison, 1991) and human resources (Nahavandi & Malekzadeh,

1988). Cultural clashes further complicate the establishment of internal well-functioning relationships (Buono and Bowditch, 1985; Cartwright and Cooper, 1993; Elsass and Veiga, 1994; Birkinshaw et al., 2000; Empson, 2001). However, in general, acquired firms will leave their totally independent and isolated position and, over time, start up internal relationships in terms of resource flows, and eventually achieve corporate influence.

The size of the subsidiary corresponds to resource constraints, and larger entities are foreseen to have wider limits for managing both knowledge sources simultaneously. The same line of argumentation is usable regarding subsidiary age, since with more experience, the subsidiary will be better to manage both knowledge creation sources. External embeddedness and external sourcing typically increase over time when compared to internal sourcing (Phene & Almeida, 2003).

### **Sample and Data Gathering**

The data for this paper was collected as part of the Centres of Excellence-project that engaged researchers in the Nordic countries, the United Kingdom, Germany, Austria, Italy, Portugal and Canada. The CoE-project was launched in May 1996 with the purpose of investigating headquarters-subsi-dary relationships and the internal flow of knowledge in MNCs. In order to collect comparable quantitative data on the acquisition of subsidiary knowledge, a questionnaire that could be applied in all the involved countries was constructed. After several project meetings and extensive reliability tests of the questionnaire on both academics and business managers, this was accomplished.<sup>1</sup>

For practical reasons, each project member was made responsible for gathering data on foreign-owned subsidiaries within their own country. Thus, all subsidiaries in the database belong to MNCs. In the data gathering, subsidiary managers, rather than headquarters, were respondents. One advantage of choosing subsidiary respondents is that they are directly engaged in the market and are therefore more acquainted with its characteristics. Although we can expect the subsidiary to have a reliable awareness of its own competencies, it would be an advantage to gather information on intra-MNC knowledge flows from other corporate units as well. However, it would be unmanageable to first identify the subsidiaries in each country and then to identify the relevant management units in the foreign MNCs.

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<sup>1</sup> For more information on the CoE project, see Holm and Pedersen (2000).

This paper is based on empirical data from seven countries: Austria, Denmark, Finland, Germany, Norway, Sweden and the UK. All countries are located in the northern part of Europe, and the four Nordic countries are relatively small, while Germany and the UK are among the largest in Europe. Approximately 80 percent of the questionnaires were answered by subsidiary executive officers, while financial managers, marketing managers or controllers in the subsidiary answered the remaining 20 percent. The response rate varies between 20 (UK) and 55 percent (Sweden), depending on the country of investigation. The quality of the data is quite high with a general level of missing values of not more than 5 percent.

XXXXXXXXXX *Insert Table1 Here* XXXXXXXXXXXX

As shown in Table 1, the total sample covers information on 2,07 subsidiaries, comprising all kinds of subsidiaries in all fields of business. Among countries, the sample size ranges from 202 (UK) to 530 (Sweden). With the exception of Sweden, the size of the sample is rather similar in the six countries. The average number of employees in subsidiaries is 742 and the median is 102. Within the five smaller countries the average size of the subsidiaries are very similar, while Germany and UK — due to larger market sizes — comprise substantially larger subsidiaries. As we expect larger subsidiaries to comprise more knowledge and therefore more potential for internal sourcing we need to control for this bias in the data material when conducting our tests of the hypotheses. For all these subsidiaries are covered information on the level of subsidiary competencies, the internal and external sourcing, and organizational context variables.

## **Measures**

All data were collected through the questionnaire and most variables are multi-item measures that were measured using seven-point Likert scales. However, items such as the number of employees were measured using actual values. The following sections provide the exact wording used for questionnaire items.

**Internal sourcing.** The construct of internal sourcing captures to what extent the subsidiary adapts to other MNC units in developing knowledge or to what extent subsidiary knowledge is developed through interaction with other MNC units. In order to measure knowledge developed through interaction with other MNC units, the respondents was asked to assess the impact of various

internal organizations on the development of the subsidiary's competencies, where 1=no impact at all, 7=very decisive impact. Four organizations were identified: headquarters, internal MNC customers, internal MNC suppliers, and internal MNC R&D units. In the models used to test our hypotheses, we use a composite measure, *Internal sourcing*, based on the average across all four items (Alpha=0.70).

**External sourcing.** The variable of external sourcing captures the extent to which the subsidiary adapts to external counterparts in their development of subsidiary knowledge. The respondents were asked to assess the impact of various external organizations on the development of the subsidiary's competencies, where 1=no impact at all, 7=very decisive impact. Six organizations were identified: external market customers, external market suppliers, specific distributor, specific external R&D unit, competitors and governmental institutions. The high inter-correlation between many of the items motivated us to construct a composite index. *External sourcing* is calculated as the average score reported by respondents across these six items (Alpha=0.64).

**Controls.** *Interdependence (Complementarity).* This variable measures the extent to which the MNC units are dependent on the subsidiaries and *vice versa*. MNC dependence on the subsidiary knowledge was assessed by asking the respondents the following question: "What would be the consequences for other units in the Foreign Company if they no longer had access to the competencies of the subsidiary?" (1=no consequences, 7=very significant consequences). In a similar vein, the subsidiary dependence on knowledge from other MNC units was captured by the following question: "What would be the consequences for the subsidiary if it no longer had access to the competencies of other MNC units?" (1=no consequences, 7=very significant consequences). Taken together, these two items reflect the interdependence between the focal subsidiary and other MNC units.

*Intra-MNC trade (import and export).* The level of intra-MNC trade is an indicator of the breadth of the internal trade links. Two items measure intra-MNC trade: the share of subsidiary sale going to other MNC units in 1996 (export) and as the share of subsidiary purchase coming from other MNC units in 1996 (import). The subsidiary transactions with other MNC units include both semi-products and final goods and services.

*Autonomy.* Based on the scale developed by Roth and Morrison (1992), respondents were asked to identify the level at which certain decisions were made, where 1=foreign corporate (HQ), 2=sub-corporate (e.g. division), and 3=subsidiary level. The decisions were as follows: hiring top subsidiary

management; entering new markets within the country; entering foreign markets; changing subsidiary organization; introducing new products/services; approving quarterly plan/schedules. Our measure, *Autonomy*, is based on the average of these six items (Alpha=0.61).

*Level of Investments* was measured by asking the respondents to indicate the level of subsidiary investments in the following seven areas on a 7-point Likert scale: research, development, production, marketing and sales, logistic, distribution and HRM. The seven items obtained an Alpha of 0.84, which allowed us to compute the level of investments as the average of the summated items. The level of investments can be seen as a proxy for the level of knowledge in the subsidiary, where the level of knowledge is expected to be positively related to internal embeddedness.

To control for structural characteristics of the subsidiary that may influence the extent of knowledge transfer, we controlled for the following factors: number of employees in the subsidiary in 1996 (a proxy for size; size is expected to be positively related to internal sourcing), share of subsidiary sales abroad, age of subsidiary (number of years since formation or acquisition, which is expected to be positively related to internal embeddedness) and, finally, mode of formation (a dummy: greenfield or acquisition).

Furthermore, we have included control variables (dummies) for each of the seven host countries (six dummies) in order to control for differences in the pattern of internal embeddedness that may be attached to the host location (e.g., foreign owned subsidiaries in Sweden may be more internally embedded than foreign owned subsidiaries in the UK). In the same vein, we have included 37 dummies to cover the 38 different home countries of the MNC headquarters in the sample. The many parameters for host and home countries (6+37=43 parameters) are only shown in the table as a “yes”, since they are only acting as control variables, but they are included in the model and data testing.

## **Results**

We have applied an OLS regression technique model to test the three hypotheses. Regarding hypotheses one and two, we have hypothesized a positive or negative straightforward linear relationship between our dependent and independent variables. The result of the total model is reported in Table 2. Numbers in parentheses represent standard errors.

XXXXXXXXX *Insert Table 2 Here* XXXXXXXXXXXX

The two hypotheses are both occupied with the relationship between internal sourcing and external sourcing. As can be seen in Table 2, this relationship is found to be positive with a highly significant parameter ( $p < 0.01$ ) for external sources. This is true even when we have controlled for a number of other factors determining the level of internal sourcing. This result supports hypothesis 2 and indicates that strong external sourcing by the subsidiary is not established at the expense of strong internal sourcing. Rather, the internal and external sourcing seem to re-enforce each other. As expected, the autonomy variable is negatively correlated with the level of internal sourcing, while interdependence, intra-MNC trade, level of investment, and the age of subsidiary all turn out to be positively related to the level of internal sourcing. The size of the subsidiary is not an explanatory factor for internal embeddedness, which impedes the resource constraint argument. Furthermore, the establishment form does not seem to influence the utilization of internal knowledge sources.

The figures in Table 3, showing model 2, support hypothesis 3 by showing a bell-shaped relationship between internal and external sourcing. The straightforward relationship is therefore only true up to a certain degree. Close relationships leading to internal embeddedness apparently exclude the need or ability to tap into external sources of knowledge.

XXXXXXXXX *Insert Table 3 here* XXXXXXXXXXXX

In general, no multicollinearity problem exists as indicated through the low VIF figures. In model 2, a naturally high correlation exists only between the two external sourcing indicators. There are only minor changes in coefficients between the control variables in the two models.

## **Conclusion**

The concept of the “differentiated MNC” implies a relatively smooth flow of knowledge inside the MNC, indicating that we should not expect an organizational trade-off between internal and external embeddedness. The institutional theory, based on dissimilarity in the MNC institutions and the local institutions of the subsidiary, would advocate for a conflict between internal and external knowledge

sourcing of subsidiaries. In this paper, we have found support for the view that that “weak” external embeddedness when tapping into external sources is not established at the expense of tapping into internal sources. However, strong embeddedness towards internal sources excludes the utilization of external sources. The subsidiaries seem to be able to handle both kinds of sources in their knowledge creation processes.



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**Table 1** Sample size and subsidiary employees in the different countries

<b>COUNTRY</b>	<b>SAMPLE SIZE</b>	<b>SUBSIDIARY EMPLOYEES (mean)</b>
Austria	313	318
Denmark	308	284
Finland	238	200
Germany	254	1.574
Norway	262	130
Sweden	530	244
UK	202	3.787
<b>Total</b>	<b>2.107</b>	<b>742</b>

**Table 2: OLS Regression: Internal Knowledge Sources of Subsidiaries as the dependent variable**

<b>Variable</b>	<b>Model 1</b>	<b>Variance Inflation Factor</b>
Intercept	5.37 (1.71)*	0
<b>External Sourcing</b>	0.47 (22.30)***	1.11
<b>Controls:</b>		
- Autonomy	-0.15 (-2.40)**	1.05
- Interdependence	0.07 (4.57)***	1.27
- Intra MNC trade (import)	0.09 (7.80)***	1.15
- Intra MNC trade (export)	0.18 (10.82)***	1.36
- Size of subsidiary (1,000 employees)	0.01 (0.73)	1.00
- Level of Investments	0.13 (5.96)***	1.18
- Form (Greenfield vs. Acquisition)	-0.02 (-0.35)	1.28
- Share of sale abroad	-0.01 (-0.66)	1.22
- Age of subsidiary	0.01 (1.72)*	1.17
Adjusted R <sup>2</sup>	0.35	
F-statistic	110.57***	
N	2108	

\*, \*\* and \*\*\* indicates 10%, 5% and 1% level of significance, respectively. T-values are in parentheses.

**Table 3: OLS Regression: Internal knowledge sources of subsidiaries as the dependent variable**

Variable	Model 2	Variance Inflation Factor
Intercept	5.48 (1.71)*	0
<b>External Sourcing</b>	0.79 (9.23)***	18.1
<b>External Sourcing<sup>2</sup></b>	-0.05 (-4.07)***	17.8
<b>Controls:</b>		
- Autonomy	-0.14 (-2.27)**	1.05
- Interdependence	0.08 (4.99)***	1.27
- Intra MNC trade (import)	0.08 (6.57)***	1.15
- Intra MNC trade (export)	0.18 (11.22)***	1.36
- Size of subsidiary (1,000 employees)	0.01 (0.56)	1.00
- Level of Investments	0.13 (5.79)***	1.19
- Form (Greenfield vs. Acquisition)	-0.02 (-0.32)	1.28
- Share of sales abroad	-0.01 (-0.65)	1.22
- Age of subsidiary	0.01 (2.23)**	1.17
- Country-dummies:		
- Host country (6 dummies)	yes	
- Home country (37 dummies)	yes	
Adjusted R <sup>2</sup>	0.38	
F-statistic	23.38***	
N	2106	

\*, \*\* and \*\*\* indicates 10%, 5% and 1% level of significance, respectively. T-values are in parentheses.



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