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The final version of this manuscript is published in *Long Range Planning*, Vol. 47 (1/2), 2014: 32-48.

The final publication is available at www.elsevier.com:

<http://www.sciencedirect.com/science/article/pii/S002463011300085X>

DOI: 10.1016/j.lrp.2013.10.007

<http://dx.doi.org/10.1016/j.lrp.2013.10.007>

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Pull the Right Levers: Creating Internationally "Useful" Subsidiary
Competence by Organizational Architecture

Maximilian Palmié, Marcus Matthias Keupp, Oliver Gassmann

Abstract

We study the effect of formal organizational architecture on the extent to which a focal subsidiary creates competence that is "useful" to other units of a multinational corporation (MNC). Elements of formal organizational architecture represent levers by which parent firm and subsidiary managers can realize their intentions. Building on motivation theory, we argue that an appropriate organizational architecture stimulates a subsidiary's motivation to create internationally "useful" competence so that its extent of competence creation will increase. We develop and empirically test hypotheses for three specific organizational elements, viz.: a home-base augmenting mission, interfaces with other MNC units, and the subsidiary's strategic and operational autonomy. Unique survey data from 287 subsidiaries provide intimate insights into the internal structure of MNCs and strongly support our account. We close by discussing the implications of our study for the academic literature, management practice, and future research.

Introduction

A multinational corporation (MNC) should manage its international subsidiaries such that these create competence which is "useful" for other organizational units of the MNC.¹ In theory, the decentralized development of competence that is leveraged by other units allows MNCs to generate additional competence and to create competitive advantage (Ghoshal & Nohria, 1989; Rugman & Verbeke, 2001).

By which means an MNC can induce subsidiary creation of such competence hence becomes an important question. Elements of formal organizational architecture should be key towards this end (Foss & Pedersen, 2004; Keupp et al., 2011). These elements are explicitly mandated and can thus be shaped more easily by direct managerial choices than elements of informal organization (e.g., organizational culture, social networks), which emerge over time (Gulati et al., 2009; Nickerson & Zenger, 2002). While parent firm managers have the formal authority to set the MNC's organizational architecture (Ghoshal et al., 1994; Meyer et al., 2011), subsidiary managers can frequently influence this process (Birkinshaw & Hood, 1998; Birkinshaw et al., 1998).

Although the general relevance of formal organizational architecture for knowledge- and competence-related processes in MNCs has been recognized for a while (e.g., Hedlund, 1986), our knowledge about the effect of specific elements is still emerging. So far, studies on subsidiary roles (Ambos & Schlegelmilch, 2007; Gupta & Govindarajan, 1991; Nobel & Birkinshaw, 1998), intra-MNC knowledge or competence transfers (Björkman et al., 2004;

¹ Competence can be defined as the ability to perform certain activities by drawing from available assets and resources (McGrath et al., 1995, p. 254). Competence thus comprises information, expertise, and know-how (Hansen & Løvås, 2004). To illustrate, some subsidiaries of the pharmaceutical company Roche have developed "useful" competence in identifying and optimizing compounds for specific therapeutic areas, and some in conducting pre-clinical and clinical studies (Criscuolo & Narula, 2007). The Singapore subsidiary of Hewlett-Packard has developed strong competence in developing and producing handheld information devices such as personal digital assistants and calculators (Frost et al., 2002).

Ciabuschi et al., 2010; Fey & Furu, 2008; Ghoshal et al., 1994; Gupta & Govindarajan, 2000; Noorderhaven & Harzing, 2009; Persson, 2006; Rabbiosi, 2011; Yang et al., 2008), and on competence creation (Persaud, 2005; Tsai, 2001) have primarily focused on subsidiary autonomy, performance evaluation and management compensation systems, and formal boundary-spanning mechanisms. However, the findings are often inconclusive and conflicting. In particular, the numerous results for subsidiary autonomy are highly divisive and all but clear. Similarly, boundary-spanning mechanisms (e.g., work process integration across units) can be powerful means to enhance competence creation and leverage in MNCs (Persson, 2006; Tsai, 2001), but not all of them seem to work well (e.g., assigning expatriates to the subsidiaries' top management team; see Björkman et al., 2004; Gupta & Govindarajan, 2000). Thus, identifying additional effective boundary-spanning mechanisms becomes important. Further, some central elements of formal organizational architecture (e.g., the content of the subsidiary's mission) have received little attention among those studies so far (Foss & Pedersen, 2004; Yang et al., 2008).

Our paper analyzes how subsidiary autonomy, formal interfaces with other MNC units, and home-base augmenting objectives in the subsidiary's mission affect subsidiary competence creation and why. Both the antecedents and the outcome considered in this paper improve our understanding of the relationship between formal organizational architecture and competence-related processes in MNCs. With regards to the antecedents, this paper a) proposes a distinction between strategic and operational autonomy, which could help resolve some of the observed inconsistencies (Glaister et al., 2003); b) substantiates additional promising boundary-spanning mechanisms, viz. cross-unit interfaces; and c) sheds light on the effect of the subsidiary's mission. These specific organizational elements have been identified as crucial paths for further research in this context (e.g., Criscuolo & Narula, 2007; Foss & Pedersen, 2004; Song et al.,

2011). With regard to the outcome, it considers the effect of these elements on subsidiary competence creation, which provides the basis for assuming advanced roles within the MNC network and for transferring competence to other MNC units. Thus, inconsistent findings with regard to subsidiary roles and competence transfer could be due to differences in the extent to which the sampled subsidiaries have created competence. Rather than studying competence creation per se, we focus on competence that is “useful” to and hence leveraged by other units of the MNC; i.e., by other subsidiaries and the parent firm. We do so because competence that is not leveraged by other units and does not prove “useful” to them typically adds little to the MNC-specific advantage, which results from *other* units leveraging the competence created by an individual unit (Meyer et al., 2011; Mudambi & Pedersen, 2007).² Therefore, our focus should provide more accurate insights to managers who wish to realize the MNC-specific advantage. Given the importance attributed to subsidiary competence creation, many scholars have highlighted that our knowledge of this topic—and especially of the impact of organizational elements on it—is not as strongly developed as would be desirable (Blomkvist et al., 2010; Foss & Pedersen, 2004; Nielsen & Michailova, 2007).

This limitation is problematic since many firms struggle with creating dispersed subsidiary competence, especially regarding internationally “useful” subsidiary competence. Indeed, many MNCs seem to prefer (re-)centralizing or completely localizing activities instead of leveraging subsidiary competence internationally (Benito et al., 2003; Doz et al., 2006; Rugman, 2005). As organizational architecture provides top managers with “some of the most powerful strategic levers” they can pull to realize their intentions (Gulati et al., 2009, p. 575), its

² To improve readability, we will mostly use the expressions “internationally ‘useful’ competence” and “internationally leveraged competence”, rather than referring explicitly to “competence that is leveraged by and proves ‘useful’ to other units of the MNC”.

effects on subsidiary competence creation should therefore be highly relevant to management practice (Foss & Pedersen, 2002).

Our paper advances theory and managerial practice by responding to this limitation. It adopts the perspective of a focal subsidiary and builds on motivation theory. Its overarching theoretical argument is that an appropriate organizational architecture stimulates this subsidiary's motivation to create internationally "useful" competence so that it will act accordingly. We test the hypotheses that our analysis develops for the three selected organizational elements with a unique sample of 287 international subsidiaries. The findings yield strong support for our theoretical account.

Thus, our study can make a number of important contributions for academia and executives. First, the paper intends to develop our understanding of the organizational means that allow firms to achieve the frequently highlighted advantages of international competence creation and leverage. Second, our focus on competence that is leveraged by and proves "useful" to other units complements the more "traditional" focus on competence transfers as it acknowledges that a competence can be leveraged by other units without being transferred to them (Rugman & Verbeke, 2001) and that competence transfer is not necessarily "useful" (Ambos & Ambos, 2009; Szulanski & Jensen, 2006). Third, our findings on the association between organizational architecture and subsidiary competence creation should be helpful for executives (Foss & Pedersen, 2004).

Theoretical Background and Hypothesis

A subsidiary has to invest substantial amounts of time and resources to create competence that can be leveraged by other units (Birkinshaw & Hood, 1998). Creating such competence is

therefore not necessarily beneficial for the subsidiary itself, even though the competence's international leverage might be beneficial for the MNC as a whole (Fey & Furu, 2008). Since subsidiaries tend to be primarily interested in their own ends and only secondarily in those of the MNC (Mudambi & Navarra, 2004), a subsidiary could refrain from creating such "useful" competence. The parent firm hence needs to motivate it to act accordingly. The basic tenet of motivation theory is that motivation can affect the acquisition of skills and abilities as well as the way skills and abilities are used in terms of direction (choosing activities), intensity (effort devoted to these activities), and duration (persistence with which activities are pursued) (Locke & Latham, 2004). Similar to agency theory (Mudambi & Navarra, 2004), motivation theory is originally located at the individual level, but can also be applied to explain the behavior of organizational units (Chen & Miller, 1994).

We therefore build on motivation theory and expect that a subsidiary will create more internationally "useful" competence, the greater its motivation is to do so. Over the years, the literature has identified a variety of theoretical mechanisms by which motivation emerges. Of particular importance in the present context are those concerning motivation in relationships and interactions since competence creation and leverage by other units tend to be "relation-specific" (Björkman et al., 2004; Lane & Lubatkin, 1998); the extent to which the subsidiary creates competence that other units find "useful" depends on the intensity and quality of the subsidiary's relationships with them. Thus, this extent is likely to depend on how much motivation these relationships entail for the subsidiary to create such competence. To enhance the extent of subsidiary competence creation, the parent firm should therefore take measures that increase the subsidiary's relation-specific motivation to develop such competence.

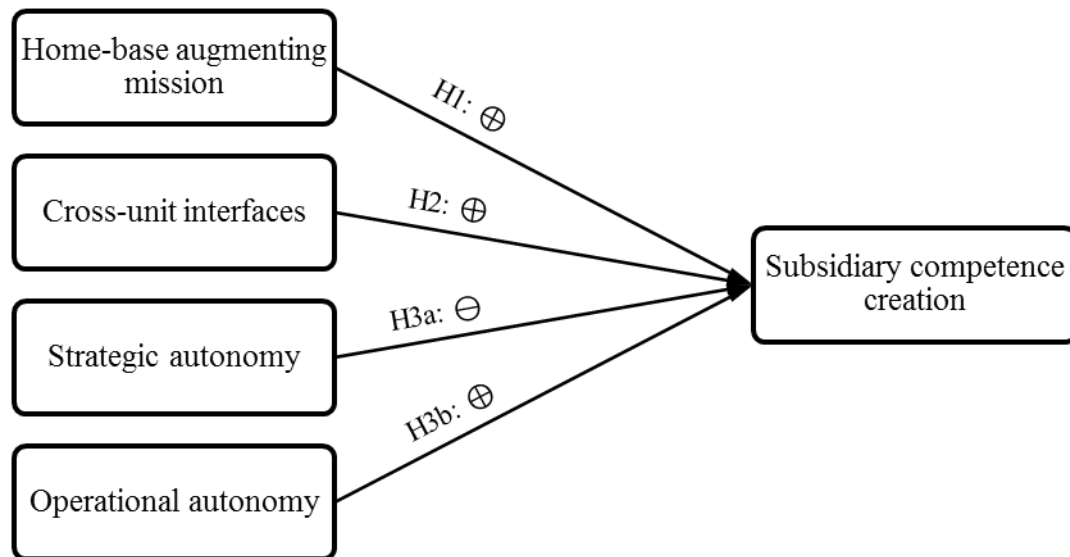
Formal organizational architecture can stimulate the motivation of organizational members to take certain actions and demotivate other efforts (Keupp et al., 2011). Setting it appropriately is therefore a particularly powerful measure by which parent firms can manage subsidiary motivation and behavior (Mudambi & Navarra, 2004). As the organizational architecture facilitates certain actions, subsidiary managers who wish to create more internationally leveraged competence could also strive to influence it; e.g., by initiative-taking and lobbying parent firm managers (Birkinshaw & Hood, 1998; Birkinshaw et al., 1998).³

This paper links specific elements of formal organizational architecture to subsidiary competence creation that are particularly likely to affect the subsidiary's relation-specific motivation to create internationally "useful" competence: Home-base augmenting objectives set the creation of competence which can be leveraged internationally as an important goal for the subsidiary (Kuemmerle, 1997), cross-unit interfaces facilitate and provide institutionalized opportunities for exchange with other units, and subsidiary autonomy relates to two "somewhat conflicting" needs that motivate behavior—the need for self-determination and the need for affiliation with others (Ambos et al., 2010, p. 1102). Goals, boundaries between actors, and autonomy are considered important antecedents to behavior in the motivation literature (Locke & Latham, 2004). The hypotheses link these antecedents to the creation of internationally "useful" competence, rather than to the creation of any competence, to pay greater attention to the MNC-specific advantage. While subsidiaries can create competence which remains in isolation, is duplicate or useless to other units (Monteiro et al., 2008), creating such competence is unlikely to contribute much to the competitive advantage of the MNC as a whole. To realize the full benefits of decentralized competence creation in MNCs, it is key that other units leverage the created

³ Note that we focus on the current organizational architecture, whereas the process and history of how a specific architecture was set is beyond the scope of this paper.

competence and find it “useful” (Meyer et al., 2011; Mudambi & Pedersen, 2007). The focus on internationally “useful” competence is also more directly linked to competitive advantage than a focus on the sheer quantity of international competence transfer would be — a transferred competence need not prove “useful” to the recipient (Haas & Hansen, 2005). A competence transfer that is not beneficial, however, seems unlikely to contribute to competitive advantage. Our focus also acknowledges that a competence can be leveraged by and “useful” to other units without being transferred to them, for instance if it is embodied in an intermediate product or a service with which they are provided (Rugman & Verbeke, 2001). Figure 1 provides an overview of our hypotheses.

Figure 1: Hypothesized Association between Central Aspects of Formal Organizational Architecture and the Subsidiary’s Creation of Internationally ‘Useful’ Competence^a



Note to figure 1: a. The empirical data confirm all hypotheses in our model (see the ‘Results’ section).

H1: Home-Base Augmenting Mission

By emphasizing home-base augmenting objectives in the focal subsidiary’s mission, the parent

firm sets the creation of internationally “useful” competence, rather than the mere exploitation of existing competence, as an important goal for the subsidiary to pursue (Kuemmerle, 1997). Several arguments suggest that a home-base augmenting mission stimulates the focal subsidiary’s motivation to create internationally “useful” competence.

First, a home-base augmenting mission should motivate subsidiary managers to direct more effort towards the creation of such competence as they know that their evaluation will depend on this criterion (Björkman et al., 2004).

Second, parent firm managers are more likely to provide financial and non-financial support to subsidiaries with a home-base augmenting mission, such as "seed money", idiosyncratic knowledge, links to competent external partners, additional staff, and time budgets (Cantwell & Mudambi, 2005; Delany, 2000; Kuemmerle, 1997). By emphasizing home-base augmenting objectives in the focal subsidiary’s mission, the parent firm signals its expectation that the subsidiary will use these additional resources to create internationally “useful” competence. Receiving support and additional resources from the parent firm generates a moral obligation on the part of the subsidiary to comply with this expectation (Keupp et al., 2011). The norm of reciprocity should motivate the subsidiary to devote more effort to creating internationally “useful” competence in order to fulfill its moral obligation and to secure ongoing access to the parent firm’s support (Monteiro et al., 2008).

Third, subsidiary managers can often induce parent firm executives to give their subsidiary a home-base augmenting mission by developing a ‘track record’ of creating internationally “useful” competence (Birkinshaw & Hood, 1998). If a subsidiary is provided with a home-base augmenting mission due to its previous track record, it may be strongly motivated to create much “useful” competence in the future. On the one hand, the formal recognition of its

achievements and the provision of rewards—in the form of benefits that are associated with a home-base augmenting mission—can be motivating (Osterloh & Frey, 2000). Additionally, their track record of creating internationally “useful” competence can develop the subsidiary staff’s belief in their self-efficacy; i.e., in their own capability to successfully execute the activities required to create such competence (Bandura, 1997; Monteiro et al., 2008). By shaping aspirations and outcome expectations, stronger efficacy beliefs increase the motivation to perform those activities (Bandura, 1997). On the other hand, there might also be a “sunk cost” fallacy at work here (Northcraft & Wolf, 1984). Thus, if a subsidiary has invested substantial effort to build the track record, it might be motivated to invest great effort into creating internationally “useful” competence in the future in order not to lose the formal recognition of its achievements.

A subsidiary will therefore be likely to possess a strong motivation to create internationally “useful” competence, if it is provided with a home-base augmenting mission. Due to the positive effect of motivation on the acquisition of beneficial skills and the extent of effort devoted to the activity in question (Locke & Latham, 2004), the subsidiary should thus create more of such competence. Hence,

Hypothesis 1: The stronger its mission emphasizes its home-base augmenting objectives, the more the subsidiary will create internationally “useful” competence.

H2: Cross-Unit Interfaces

Cross-unit interfaces are formal organizational integration mechanisms that span the boundaries between the focal subsidiary and other MNC units (Jansen et al., 2009). Examples of such

interfaces comprise liaison personnel to coordinate decisions with other units, job rotation programs with other units, and meetings that involve managers from the subsidiary and from other units.

Cross-unit interfaces establish information channels between the focal subsidiary and other units that allow for a smooth and rich information flow between them (Björkman et al., 2004; Gupta & Govindarajan, 2000). This effect helps the subsidiary identify specific specialist knowledge available there (Reiche et al., 2009) and thus provide it with the opportunity to further develop competence by building on other units' knowledge and recombining existing knowledge elements (Mudambi & Navarra, 2004). This opportunity can be very promising in that the availability of relevant prior knowledge frequently implies a substantial reduction in the effort that is necessary to develop new competitive competence (Fleming, 2001). When actors become aware of promising opportunities, they tend to develop a motivation to pursue these (Rice et al., 1985). By facilitating the identification of promising opportunities to develop competence, cross-unit interfaces are therefore likely to contribute to motivating the subsidiary to create such competence.

Cross-unit interfaces typically also improve the coordination among the units (Johnston & Paladino, 2007) and enhance their understanding of each other's tasks, capabilities, and objectives (Schulz, 2003). These effects support the focal subsidiary in recognizing what competence would be duplicate to or incompatible with other units' existing competence and what characteristics would render its competence more likely to be relevant and thus finally "useful" to these other units (Monteiro et al., 2008; Yang et al., 2008). This can stimulate the subsidiary's motivation to create internationally "useful" competence because organizational members will usually be more motivated to perform a desired behavior if they perceive this

behavior to be structurally supported by the firm (Marvel et al., 2007). Moreover, in light of an improved coordination, the focal subsidiary may assess any created competence to be more likely to be actually leveraged by other units. Since a subsidiary can expect valuable outcomes—such as more influence on the MNC’s strategic decisions—from creating competence if this competence is actually leveraged by other units, but not necessarily if its competence remains unleveraged (Forsgren & Pedersen, 2000; Mudambi & Navarra, 2004), the expected likelihood of favorable outcomes increases. This effect can also contribute to its motivation to create internationally “useful” competence since motivation depends on the expected likelihood of favorable outcomes (Chen & Miller, 1994). Hence,

Hypothesis 2: The more cross-unit interfaces with other organizational units the focal subsidiary has, the more it will create internationally “useful” competence.

H3: Autonomy

We differentiate between a subsidiary’s *strategic* and its *operational* autonomy, following recommendations in prior literature to adopt this conceptual separation to increase the theoretical and empirical validity of the autonomy construct (Glaister et al., 2003; Nobel & Birkinshaw, 1998). *Strategic* autonomy designates the focal subsidiary’s ability to set its own agenda; *operational* autonomy its ability to manage selected day-to-day activities autonomously (Keupp et al., 2011; Perlow, 1998).⁴ We build separate hypotheses for the respective effects of strategic and operational autonomy, turning to strategic autonomy first.

⁴ Case-based illustrations show that subsidiaries with a high level of strategic autonomy could make independent decisions whenever their business interests were directly involved, whereas those with a high degree of operational, but not strategic autonomy were free to manage their day-to-day responsibilities, while they had very little or no control over their budget and business plan (Birkinshaw, 1996; Glaister et al., 2003).

We expect that a higher level of *strategic* autonomy will *decrease* the extent to which the focal subsidiary creates competence that is leveraged by and proves “useful” to other units of the MNC. Thus, the expectation for this particular type of competence may run counter to what one might expect for the subsidiary’s creation of any competence. More strategic autonomy might lead to more extensive competence creation *in general* because the subsidiary could use its strategic freedom to embrace those opportunities that appear most rewarding to the subsidiary itself and that fit best with its specific skills and needs (Birkinshaw et al., 1998). However, competence created in this way does not necessarily meet the requirements of other units in the MNC network (Cantwell & Mudambi, 2005; Keupp et al., 2011). They could therefore refrain from leveraging it (Yang et al., 2008), the consequence being that the extent to which the focal subsidiary creates competence that is leveraged by other units need not increase when the subsidiary creates more competence in general.

A low degree of strategic autonomy makes creating competence that is only “useful” to itself, but not to other units less attractive for the focal subsidiary and increases, in comparison, the subsidiary’s motivation to create internationally “useful” competence. First, predetermining the subsidiary’s agenda allows the parent firm to decide on the subsidiary’s fundamental resource employments. These decisions can initiate path dependencies that make creating internationally “useful” competence more rewarding for the subsidiary than pursuing alternative opportunities that might not be “useful” to other units. For reasons of legitimacy, required effort and expected rewards, organizational members tend to be motivated to comply with path dependencies (Sydow et al., 2009). Second, by setting the subsidiary’s agenda appropriately, the parent firm can facilitate the coordination between the focal subsidiary and other units (Doz & Prahalad, 1981), which may induce the subsidiary to satisfy its need to be affiliated with others

through a closer connection to other MNC units rather than through an exclusive connection to external partners from its business environment (cf. Forsgren et al., 2000). Since the need of affiliation exerts a motivational force (Ambos et al., 2010; Ryan & Deci, 2000), the focal subsidiary should be more motivated to create competence that other MNC units find "useful".

Postulating a negative influence of strategic autonomy on the extent to which the subsidiary creates internationally "useful" competence is consistent with Ambos et al.'s (2011, p. 306; emphasis added) expectation that "the benefits of *strategic* consistency [...] outweigh the costs of recentralizing decision making authority." Similarly, Asakawa (2001, p. 749) has highlighted that even though subsidiaries value autonomy, they strive for connectivity as well and are willing to forego some autonomy for the sake of being better connected with the rest of the MNC. Therefore,

Hypothesis 3a: The more strategic autonomy the focal subsidiary is granted, the less it will create internationally "useful" competence.

We further argue that the more *operational* autonomy the focal subsidiary has, the *more* it will develop internationally "useful" competence. First, operational autonomy is likely to increase the rewards that the subsidiary can expect from engaging in competence creation. When the subsidiary has operational autonomy, its management can adopt workplace practices and conditions that are most appropriate for the cultural preferences and particular skills of the subsidiary staff (Glaister et al., 2003). Operational autonomy allows subsidiary employees to approach problems in ways that make the most of their expertise and creative-thinking skills, and can stimulate their intrinsic motivation (Amabile, 1997). Operational autonomy is therefore likely to foster their creativity and to contribute to the subsidiary's competence development

(Amabile, 1997; Ambos & Schlegelmilch, 2007). Thus, the subsidiary may expect that engaging in competence creation will lead to particularly strong and extensive competence, if it has a high degree of operational autonomy. This effect can further motivate the subsidiary to engage in this activity since the more favorable the expected outcomes are, the more motivation tends to increase (Steers et al., 2004).

Second, the likelihood that other units actually find the competence created by an operationally autonomous subsidiary “useful” should also be relatively high. On the one hand, the competence can be quite rare within the MNC since it draws on the particular expertise and skills of the subsidiary’s employees (Lewin et al., 2009). On the other hand, managing day-to-day activities autonomously is rather unlikely to severely limit the extent to which the subsidiary’s competence is relevant to other units and compatible with their competence (Keupp et al., 2011). Due to these reasons, an operationally autonomous subsidiary may consider it very likely that engaging in creating internationally “useful” competence leads to favorable outcomes such as recognition by and an improved social status in the MNC community (Ambos et al., 2010), and assessing the likelihood of favorable outcomes highly can again drive its motivation to engage in this activity (Steers et al., 2004).

Finally, operationally autonomous subsidiaries are frequently entitled to manage the exchange relations with other units autonomously (Nobel & Birkinshaw, 1998). This freedom may allow them to minimize conflicts between their engagements in exchange relations and their own operations (Ciabuschi et al., 2010) and can stimulate their intrinsic motivation to engage in such relations (Amabile, 1997).

Overall, operational autonomy can thus contribute to subsidiary motivation by giving the focal subsidiary the opportunity to act autonomously and still be affiliated with other MNC units.

Operational autonomy hence satisfies the two "somewhat conflicting" needs for self-determination (acting autonomously) and for affiliation with others, respectively, that both motivate behavior (Ambos et al., 2010, p. 1102; Ryan & Deci, 2000). Thus,

Hypothesis 3b: The more operational autonomy the focal subsidiary is granted, the more it will create internationally "useful" competence.

Data and Methods

Population and sampling frame.

Our sample consisted of subsidiaries that undertake innovation and/or perform research and development (R&D) since these tasks offer opportunities for the creation of "useful" competence, which can be leveraged internationally (Cantwell & Mudambi, 2005; Meyer et al., 2011). These subsidiaries may perform other value activities in addition to R&D.

We used the database Thomson ONE to identify Swiss and German firms irrespective of their industry affiliations. Since firms in Switzerland and Germany typically display a high degree of R&D internationalization (Serapio & Dalton, 1999), this setting provides a fruitful context to study subsidiary competence creation and potential problems with it. Further, since Germany and Switzerland are neighboring and culturally highly similar countries (Hofstede et al., 2010), our results are unlikely to be biased by potential effects of geographical and cultural distance between parent firms and subsidiaries once we control for subsidiary location. Through this process a total of 1,254 firms (983 German, 271 Swiss) were identified.

We only included those firms in the sampling frame which were MNCs and controlled at least one foreign subsidiary with R&D activity. The firms' annual reports and confirmatory phone calls served to classify firms according to these criteria. Consequently, 750 firms had to be

excluded from the sampling frame. On average, the 504 remaining firms accounted for 68% of all sales by German and Swiss firms in their respective industries. We contacted the top management of these 504 firms to explain our research topic and to ask for participation in our study. 159 firms (104 German, 55 Swiss) agreed to cooperate. By correspondence with corporate-level senior managers, 923 foreign subsidiaries were identified. These 923 subsidiaries constitute the population to which we sent out the questionnaire.⁵

Item development.

Following prior literature on MNC subsidiaries (e.g., Fey & Furu, 2008; Gupta & Govindarajan, 2000; Noorderhaven & Harzing, 2009), we adopted a psychometric measurement approach and collected survey data from individual informants. While such shared unit-level constructs (Klein & Kozlowski, 2000) are naturally an approximation, the interviews during the item revision phase indicated the subsidiaries' top managers would be able to make valid and reliable assessments. Additionally, we performed multiple precautionary procedures to rule out potential biases.

To generate our items, we carefully reviewed the relevant literature and related scales. Where no established scales to measure our constructs were available, we employed a rigorous item creation and validation process for these scales, adhering to recommendations in the measurement literature (Churchill, 1979; Schriesheim et al, 1993). The process began with the production of a preliminary item list based on the reviewed literature. Iterative rounds of discussions with inter- national academics and managers followed to ensure the content, face, and external validity of the emerging constructs. If necessary, their feedback yielded substantive

⁵ The same survey provided the basis for Keupp et al. (2011). The dataset analyzed there differs slightly from the dataset used in the present paper due to the exclusion of discordant observations (see footnote 7).

changes to the latest list. The revised list was then discussed with professors and managers until both groups agreed that no further clarifications and amendments would be required. Thus, we were able to produce a carefully tested questionnaire instrument.

Measurement

The subsidiary is the unit of analysis in this study. Accordingly, all variables are located at the subsidiary level. The scales, their items and their Cronbach's alpha are replicated in the Appendix. To construct each scale, we added its individual item scores and subsequently divided the sum by the number of items in it (Trevor and Nyberg, 2008).

Dependent variable.

Creation of internationally "useful" competence measures the extent to which the focal subsidiary has created this particular type of competence. By "internationally 'useful' competence", we mean competence that is leveraged by and proves "useful" to other units of the MNC; i.e., other subsidiaries and the MNC's parent firm. Previous efforts on which this scale and its items draw include Forsgren and Pedersen (2000), Frost et al. (2002), and Keupp et al. (2011).

Independent Variables.

Home-base augmenting (HBA) mission was measured by a self-developed scale, which determines how much emphasis is placed on objectives to augment the MNC's existing competence base in the subsidiary's mission. Kuemmerle's (1997) delineations provided a main

source for generating the corresponding items. The scale for *cross-unit interfaces* measures the extent to which the focal subsidiary has formal interfaces with other MNC units. It combines items from several previous scales (Gupta & Govindarajan, 2000; Jansen et al., 2009; O'Donnell, 2000; Persson, 2006). *Strategic and operational autonomy* are measured on two separate scales that assess to what degree the focal subsidiary is autonomous from its parent firm in making strategic and operational decisions. These scales were adapted from Nobel and Birkinshaw's (1998) "centralization" scale.⁶ Since an organization's products are highly important to realize value from its competence, we supplemented the "centralization" scale by the item "product design" from Birkinshaw (2002). With the difference that scale optimization suggested representing "operational autonomy" by five items in the present paper, while the scale in Keupp et al. (2011) utilizes four items, these two autonomy scales are also featured in Keupp et al. (2011).

Control variables.

To control for the *observability of competence*, we reused the scale "observability of knowledge" from Keupp et al. (2011) that measures how well the subsidiary's knowledge can be learned by observation. We relabeled this scale to "observability of competence", following previous literature that frequently switches between the terms "knowledge", "competence", and "knowledge and competence" (e.g., Björkman et al., 2004; Foss and Pedersen, 2004; Fey and Furu, 2008; Mudambi and Navarra, 2004). Similarly, we adapted Keupp et al.'s (2011) scale "tacitness of knowledge", which was based on Zander and Kogut (1995) and Birkinshaw et al. (2002), to control for the *codifiability of competence*. This scale measures how easily the

⁶ Nobel and Birkinshaw (1998, p. 495) found that their centralization scale resulted in two different factors, which they termed "strategic issue centralization" and "operational issue centralization".

subsidiary's competence can be described and learned. Following scale optimization, the present paper employs a three-item scale instead of Keupp et al.'s (2011) four-item solution. Additionally, we control for *R&D intensity* by measuring the subsidiary's R&D expenses relative to its budget, for *subsidiary size* by the logged number of its employees, for *subsidiary age* by subtracting the year in which the subsidiary started operations for the parent firm from 2009, for *subsidiary location* by country dummies and for *subsidiary industry* by industry dummies based on the NACE classification.

Questionnaire and data collection procedure

Validated academic procedures of questionnaire design (Dillman, 2000) informed the production of our fully standardized questionnaire. To collect data, we e-mailed a copy of the questionnaire to every subsidiary together with a cover letter explaining the aims of the study, guaranteeing complete confidentiality, and offering the study results as an incentive to cooperate. Short phone calls were made to announce our questionnaire will arrive and to ask the subsidiaries' top managers (our key informants) for their cooperation. Managers who had not yet responded received reminder letters 14 and 30 days after the original questionnaire. 290 of the 923 subsidiaries responded, yielding a favorable response rate of 31.42%. We excluded three of these questionnaires from further analysis because of too much missing data.⁷ A raw sample of 287 questionnaires remained with no or only few missing data that were completely at random. We followed a conservative estimation strategy and instructed the statistical software to do list-wise

⁷ Not included in the response statistics are fourteen subsidiaries that provided information, but were excluded from the analysis based on extensive screening and tests (e.g., examining leverage-versus-residual plots, calculating DFBETA, etc.). Excluding some observations from the sample is in line with arguments that shedding discordant observations can lead to estimates which are more accurate for the population at large (Barbato et al., 2011; Osborne and Overbay, 2004). The extent to which we excluded observations (14 out of 304, 4.61%) is consistent with previous research (e.g., Cho and Pucik, 2005; Kotha et al., 2001; Sampson, 2007). The results are very similar when fewer observations are excluded.

deletion on cases where information regarding one or more model variables is missing; thus, the models use less than 287 observations.

Post-hoc tests, validation surveys, single respondent bias and common method variance

Several post-hoc analyses and validation surveys served to assure the representativeness of respondent data and to validate responses received from informants. We detected no significant response bias by response vs. non-response, response time, and subsidiary demographic characteristics. Moreover, there was no evidence that a large number of subsidiaries responded from a single MNC and caused biasing cluster effects.

Following the recommendations by Chang et al. (2010) and Podsakoff et al. (2003), we employed multiple procedural (ex ante) and statistical (ex post) approaches to rule out single respondent bias and common method variance (CMV). The procedural approaches included: different question formats and scale anchors for our constructs; a cover story to create a psychological separation between independent and dependent variables; counterbalancing the question order; assuring respondents of the anonymity and confidentiality of our study, that there are no right or wrong answers, and to answer as honestly as possible; and finally, validating the respondents' answers with data from multiple sources (two randomly drawn subsamples of parent firm and second subsidiary managers, respectively).⁸ Common method bias concerns were alleviated by high inter-rater reliability between the original and the validation data (Nunnally & Bernstein, 1994). In terms of statistical remedies to counter CMV, we did not only employ

⁸ Interviews with managers during the item revision phase suggested that contacting managers in the respective parent firm, rather than managers in receiving subsidiaries, would be a more promising approach to the external validation of the focal subsidiary's assessment of its creation of competence that is "useful" to other units. While subsidiary managers are in an excellent position to assess how "useful" the competence developed by the focal subsidiary is for their own subsidiary, they typically are less familiar with the extent to which the MNC as a whole has leveraged the focal subsidiary's competence.

Harman's one-factor test which indicated no bias caused by CMV (seven factors emerged, the first only explaining 12.19% of the variance; see Podsakoff & Organ, 1986). We also added one latent CMV factor to our structural equation model (Podsakoff et al., 2003). Examining the significance of the structural parameters both with and without this latent factor in the model does not reveal substantial differences.⁹ Overall, the various approaches unanimously suggest that our results are unlikely to be biased substantially by CMV.

Assessment of reliability and validity of measure

The reliability and validity of both our items and our scales were tested using diverse approaches. All of these methods consistently indicate high levels of reliability and validity.¹⁰ The reliability of our items was tested by calculating item-test, item-rest, and average inter-item correlations, the reliability of our scales by calculating Cronbach's alpha (Nunnally & Bernstein, 1994). *Convergent validity* of our items was verified by calculating overlap-corrected¹¹ correlations between an item and the scale it pertains to (cf. Nunnally & Bernstein, 1994), and convergent validity of our scales by applying principal component factor analysis with oblique rotation.¹² Ultimately, we retained 26 items, which formed seven scales.¹³ Table 1 details loadings, cross-loadings, and communalities for these items. High direct factor loadings and low cross-loadings indicate a high degree of convergent validity (Hair et al., 1998).

Table 1. Final set of oblimin-rotated factors

Loading on oblimin-rotated factor

⁹The manuscript provides results from the model without the latent CMV factor. The results from the model with this factor added are available upon request.

¹⁰ The results of these calculations are not reported here to conserve space, they are available upon request.

¹¹ That is, the scale is calculated without the specific item in question to avoid inflating the correlation.

¹² We used oblique rotation because we expected the emerging factors to be theoretically related (Hair et al., 1998).

¹³ Both Bartlett's test of sphericity ($\chi^2 = 2421.103$ with 325 d.f., $p = 0.000$) and the Kaiser-Meyer-Olkin measure of sampling adequacy ($MSA = 0.782$) indicated the data were eligible for factor analysis. A factor was retained prior to rotation if its eigenvalue exceeded unity (Kaiser-Guttman criterion).

Item (paraphrased) ^a	1 Home- base augmen ting	2 Compete nce creation	3 Operati onal autono my	4 Cross- unit interfa ces	5 Codifi - abilit y	6 Strategi c autono my	7 Observab ility	Communi tality
CC1: Creation of know-how applied in other units	0.0497	0.8709	0.0406	0.1145	0.0831	-0.0472	0.0264	0.7856
CC2: Creation of competence useful in other units	0.0805	0.8550	-0.0069	0.1270	0.0461	0.0380	-0.0064	0.7572
CC3: Created technol. expertise demanded by other units	0.3277	0.7763	0.0129	0.1374	-0.1261	-0.0433	-0.0337	0.7480
CC4: Provision of created competence	0.2756	0.6129	0.0174	0.3148	-0.1235	-0.1491	-0.0048	0.5885
HBA1: Explore new technological opportunities	0.8694	0.1888	0.0234	0.0310	0.0228	0.0707	0.0261	0.7993
HBA2: Collaborate with local universities or firms	0.8275	-0.0150	0.1078	0.2181	0.0999	-0.0160	-0.0670	0.7588
HBA3: Exploit better local R&D environment	0.7893	0.1639	0.0783	0.0647	-0.0107	-0.0860	0.1036	0.6785
HBA4: Generate specialized technological knowledge	0.8266	0.1467	-0.0737	0.0140	0.0026	0.1505	-0.0237	0.7337
CUI1: Position to coordinate with MNC units	0.2319	0.3069	0.0723	0.6331	-0.0378	-0.0951	-0.0069	0.5645
CUI2: MNC units mentor for focal managers	0.0591	0.2250	-0.0685	0.7151	-0.0920	-0.0651	0.0217	0.5833
CUI3: MNC unit managers attend focal meetings	0.1797	0.3302	-0.0900	0.6836	0.0411	-0.0769	0.0339	0.6254
CUI4: Job rotation programs with other units	0.1115	0.1204	-0.0872	0.7715	0.0159	0.0410	-0.0896	0.6396
SA1: Direction of activities	-0.0339	-0.1387	0.1478	-0.0480	0.0246	0.7851	-0.0711	0.6665
SA2: Choice of new projects	0.0287	-0.0296	0.1580	-0.0391	-0.0477	0.8569	0.0740	0.7702
SA3: Product design decisions	0.2305	0.0557	0.1023	-0.0375	0.0020	0.6832	0.2402	0.5926
OA1: Hiring and firing senior staff	0.2027	-0.0442	0.6034	-0.0355	-0.0626	0.3194	-0.0788	0.5205
OA2: Cooperation with other	0.0846	0.0553	0.6209	0.1676	-0.021	0.3256	0.0384	0.5318

subsidiaries in firm					5			
OA3: Training programs for subsidiary staff	0.0789	0.0985	0.7500	-0.1746	-0.0164	0.0462	0.6113	
OA4: Salary level of subsidiary employees	0.0125	-0.0301	0.7495	-0.0714	-0.0399	-0.0033	0.5717	
OA5: Transfer of subsidiary staff between units	-0.0713	-0.0019	0.6893	-0.0082	0.1103	-0.1043	0.5646	
COD1: Technology easily described in manuals	-0.0233	-0.0304	-0.0031	0.0925	0.7882	0.1757	0.6627	
COD2: Skilled employees easily teach new employees	0.0311	0.0063	-0.0132	-0.0428	0.8807	0.1929	0.8205	
COD3: Quick and easy to train new employees	0.0952	0.0137	0.0044	-0.0770	0.8079	0.1201	0.6934	
OBS1: Imitation through observation of employees	0.0544	0.0754	0.0425	0.0116	0.2811	0.7368	0.6328	
OBS2: Imitation through tour of facilities	0.0043	-0.0234	0.0057	-0.0235	0.1694	0.8823	0.8115	
OBS3: Imitation through examining machines and equipment	-0.0193	-0.0293	-0.0827	-0.0229	0.1127	0.8203	0.7008	
<i>Eigenvalue</i>	4.90	3.47	3.07	1.89	1.56	1.37	1.14	
<i>Proportion of variance explained</i>	12.19%	11.03%	9.49%	8.70%	8.67%	8.46%	8.44%	
<i>Cumulative variance explained</i>	12.19%	23.22%	32.71%	41.41%	50.08%	58.54%	66.97%	

Note to table 1: a. See the appendix for a full account of each item's wording.

Finally, *discriminant validity* was examined by employing a multitrait and multi-item correlation matrix approach, in which the correlation of each item with each scale is considered (Ware & Gandek, 1998). Furthermore, we calculated average variance extracted and compared its square root to the correlation coefficients among the scales (Staples et al., 1999). High levels of discriminant validity were indicated by both analyses.

Results

Descriptive statistics and results of hypothesis testing.

Table 2 provides descriptive statistics and correlations for all variables. Since the dependent variable is conditioned on values between 1 and 7, we estimated Tobit regression models (Greene, 2003). We specified these models to report robust (Huber-White) standard errors to correct for potential heteroscedasticity. All models were constructed incrementally by first entering only the controls in a baseline model and then adding the covariates of each hypothesis step by step. Akaike information criteria (AIC) indicate that the full model which includes all independent and control variables fits the data best. Table 3 documents all models and their diagnostics.

Table 2. Descriptive statistics and correlations^{a, b}

Variable	1	2	3	4	5	6	7	8	9	10
1 Subsidiary competence creation	1.000									
2 Home-base augmenting mission	0.338***	1.000								
3 Cross-unit interfaces	0.557***	0.336***	1.000							
4 Strategic autonomy	-0.068	0.127*	-0.129*	1.000						
5 Operational autonomy	-0.010	0.118†	-0.136*	0.385***	1.000					
6 R&D intensity	0.299***	0.269***	0.137*	-0.054	0.010	1.000				
7 Size ^c	0.227***	0.043	0.193**	0.097†	0.084	-0.072	1.000			
8 Age	0.244***	0.007	0.232***	-0.036	-0.103†	-0.082	0.228***	1.000		
9 Codifiability of competence	0.022	0.068	0.029	-0.012	-0.016	-0.137*	-0.039	-0.030	1.000	
10 Observability of competence	-0.001	-0.006	0.065	0.087	-0.125*	-0.224***	0.020	0.030	0.334***	1.000
Mean	4.084	3.499	2.880	4.342	4.838	13.554	5.592	20.301	3.638	3.308
Std. dev.	1.323	1.597	1.157	1.268	1.055	25.193	1.799	21.610	1.312	1.344
Min	1	1	1	1	1.6	0	0.693	0	1	1
Max	7	7	6.75	7	7	100	10.933	161	7	7

^a Correlations for country and industry dummies are not shown; they are available from the corresponding author.

^b Spearman correlations. † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

^c Logged variable.

Table 3. Robust Tobit estimates for dependent variable *Creation of internationally 'useful' subsidiary competence*^{a, b}

	Model 1 (Baseline)	Model 2	Model 3	Model 4 (Full)
Home-base augmenting mission		0.265*** (0.049)	0.131** (0.051)	0.163** (0.054)
Cross-unit interfaces			0.473*** (0.070)	0.467*** (0.071)
Strategic autonomy				-0.162* (0.073)
Operational autonomy				0.139* (0.071)
R&D intensity	0.015*** (0.003)	0.011*** (0.003)	0.010** (0.003)	0.009* (0.004)
Size	0.191*** (0.046)	0.156*** (0.045)	0.111** (0.041)	0.082* (0.042)
Age	0.005 (0.003)	0.006† (0.003)	0.005† (0.003)	0.005 (0.003)
Codifiability of competence	-0.044 (0.073)	-0.075 (0.065)	-0.080 (0.064)	-0.073 (0.064)
Observability of competence	0.024 (0.068)	0.003 (0.060)	0.046 (0.062)	0.042 (0.060)

Switzerland	0.140 (0.245)	0.061 (0.253)	0.026 (0.227)	0.001 (0.227)
USA	-0.173 (0.235)	-0.230 (0.241)	-0.148 (0.220)	0.026 (0.212)
China	-0.926*** (0.276)	-0.859*** (0.254)	-0.979*** (0.210)	-1.132*** (0.225)
Italy	0.833* (0.355)	0.821* (0.335)	0.366 (0.300)	0.492 (0.308)
France	0.088 (0.430)	-0.052 (0.418)	-0.191 (0.423)	-0.149 (0.400)
UK	0.242 (0.381)	-0.085 (0.349)	0.214 (0.401)	0.265 (0.383)
Other Western Europe	0.122 (0.287)	0.165 (0.285)	0.040 (0.288)	0.184 (0.285)
Eastern Europe	-0.472 (0.333)	-0.220 (0.354)	-0.136 (0.323)	-0.267 (0.346)
Other America	-0.195 (0.350)	-0.105 (0.339)	-0.069 (0.383)	-0.048 (0.381)
Other Asia	-0.085 (0.420)	-0.148 (0.395)	-0.214 (0.360)	-0.166 (0.383)
Other locations	-0.800* (0.402)	-0.709† (0.433)	-0.841* (0.323)	-0.689* (0.337)
Electronics	0.338 (0.265)	0.329 (0.258)	0.188 (0.254)	-0.022 (0.277)
Chemicals	0.192 (0.237)	0.213 (0.232)	0.038 (0.213)	-0.033 (0.212)
Pharmaceuticals	0.112 (0.327)	0.070 (0.303)	0.281 (0.282)	0.159 (0.288)
Basic metals	-1.083* (0.475)	-1.081* (0.512)	-0.815* (0.419)	-0.978* (0.462)
Automotive	0.568* (0.276)	0.589* (0.268)	0.526* (0.249)	0.551* (0.237)
Electrical equipment	-0.005 (0.328)	0.025 (0.319)	0.031 (0.274)	0.107 (0.275)
Other	0.087 (0.242)	0.145 (0.228)	0.010 (0.209)	-0.060 (0.213)
Constant	2.744*** (0.400)	2.242*** (0.392)	1.636*** (0.388)	1.813*** (0.546)
Log-pseudolikelihood	-366.514	-349.023	-302.999	-284.049
McFadden's Pseudo R ²	0.102	0.135	0.198	0.205
F statistic (d. f.)	5.21*** (23; 217)	7.26*** (24; 213)	13.41*** (25; 197)	11.46*** (27; 184)
AIC	783.029	750.046	659.998	626.098
Number of observations	240	237	222	211

Notes to table 3: a. † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed test). Robust standard errors in parentheses.

b. Germany and Machinery are the respective baseline categories for the country and the industry dummies.

For all hypotheses, the found signs match the predicted signs. All three hypotheses are supported: H1 which posited a positive relationship between a home-base augmenting mission and subsidiary creation of internationally “useful” competence at $p < 0.01$; H2 which asserted a positive relationship between cross-unit interfaces and competence creation at $p < 0.001$; H3a which predicted a negative relationship between strategic autonomy and competence creation at $p < 0.05$; and H3b which posited a positive relationship between operational autonomy and competence creation also at $p < 0.05$. Additionally, we find that R&D intensity and size are positively associated with competence creation ($p < 0.05$ for both coefficients), whereas subsidiaries that are located in China ($p < 0.001$) or in a country of the ‘other’ category ($p < 0.05$) tend to create less competence that is “useful” to other MNC units than subsidiaries located in Germany (our reference category). Furthermore, competence creation is negatively associated

with a subsidiary being in the basic metals manufacturing industry ($p < 0.05$), and positively with it being in the automotive industry ($p < 0.05$).

Sensitivity tests and alternative specifications

We performed additional analyses to test the validity of these results. First, estimating robust OLS regression models allowed us to test whether or not the residuals are normally distributed (the central assumption of Tobit models). Both a standardized normal probability plot as well as Shapiro-Wilk and Kolmogorov-Smirnov tests indicated this was the case. Computing variance inflation factor (VIF) indices alleviated multicollinearity concerns (maximum VIF = 2.26; mean VIF = 1.57; see Chatterjee et al., 2000). Moreover, the patterns of significance across all coefficients as well as their signs are the same for Tobit and OLS models.¹⁴

Additional robustness test: Structural Equation Modeling (SEM).

As an additional robustness test of our regression results, we tested our hypotheses with maximum likelihood structural equation modeling (SEM). SEM offers the advantages of simultaneously incorporating observed and latent constructs and of accounting for potential biasing effects of random measurement error in the latent constructs (Kline, 2010; Medsker et al., 1994). We adopted Anderson and Gerbing's (1988) frequently recommended two-step approach (e.g., Medsker et al., 1994; Simsek et al., 2005).

In the first phase, a confirmatory factor analytic (CFA) model is fit to the observed data to assess the fit of the overall measurement model and to examine the psychometric properties of constructs. The CFA model fits the data well ($\chi^2 = 294.28$ with 265 d.f., $p < 0.10$; GFI = 0.91;

¹⁴ The detailed OLS results are available from the corresponding author upon request.

AGFI = 0.88; NFI = 0.88; NNFI = 0.98; CFI = 0.99; RMSEA = 0.02) (Kline, 2010; Teo et al., 2003).¹⁵ Comparing the fit of two models each—one where the correlation between two specific factors was unconstrained with another where the correlation between them was constrained to 1.0—by chi-square difference tests indicates that in all cases, the unconstrained model fits the data significantly better than the constrained version, thus signaling the discriminant validity of our constructs.¹⁶ These results suggested that our measurement model is adequate and that we could proceed with the second phase of Anderson and Gerbing's (1988) approach (Simsek et al., 2005).

In the second phase, contrasts (chi-square difference tests) between a sequence of nested structural models are used to obtain the model that best accounts for the observed covariances.¹⁷ This sequence of nested structural models comprises the hypothesized model, in which all four¹⁸ hypothesized organizational elements are tested concurrently, and models that constrain the influence of one, two, three, or all four element(s) on "creation of internationally 'useful' competence" at zero. The results indicate that the hypothesized model is the best-fitting one. It fits the data well ($\chi^2 = 444.02$ with 372 d.f., $p < 0.01$; GFI = 0.89; AGFI = 0.85; NFI = 0.85; NNFI = 0.96; CFI = 0.97; RMSEA = 0.03) (Kline, 2010; Teo et al., 2003) and significantly better than the nested, constrained models (two-tailed chi-square difference tests with $p < 0.05$ or better in every case).

¹⁵ Moreover, it provides further support for the convergent and discriminant validity of our measures and alleviates multicollinearity concerns. The large and statistically-significant factor loadings among the indicators and their corresponding latent construct indicate convergent validity (Hair et al., 1998; Simsek et al., 2005); discriminant validity is indicated by the fact that no correlation between any latent constructs exceeds the recommended threshold of 0.65. The latter fact simultaneously alleviates multicollinearity concerns (Brown, 2006; Simsek et al., 2005).

¹⁶ We do not provide detailed results of all the tests we performed due to limitations of space. Extensive results are available from the corresponding author upon request.

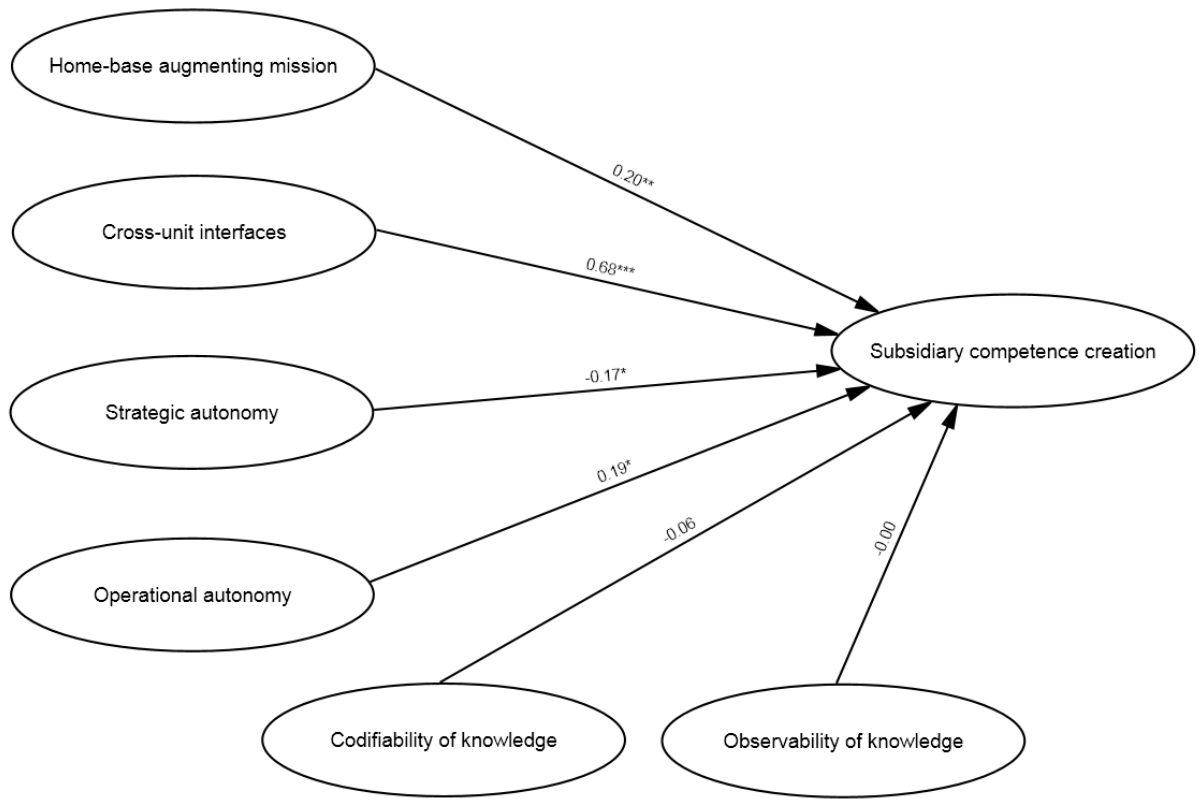
¹⁷ The structural models differ from the final measurement model from phase 1 in that they further include observed variables.

¹⁸ Counting the two facets of autonomy as two elements.

We therefore used the results from the hypothesized model shown in Figure 2 to assess our hypotheses. As in the regression analyses, all hypotheses are supported: H1 at $p < 0.01$, H2 at $p < 0.001$, and H3a as well as H3b at $p < 0.05$

We are therefore confident that our results are not computational artifacts.

Figure 2: Structural Equation Model^{a, b, c, d, e, f}



Notes to figure 2:

a. For reasons of readability, the figure shows only extracts of the model that was estimated. The model was estimated under inclusion of further control variables, viz: R&D intensity, subsidiary size (logged), subsidiary age, and country dummies (the reference category was again omitted from the analysis). Covariances among exogenous variables were modeled, but are not reported here either. Error variables are also excluded from the presentation. Extensive results are available from the corresponding author upon request.

b. Including industry dummies as well decreases model fit, but does not significantly change the pattern, in which the SEM supports our hypotheses. We therefore omitted these dummies in the reported model. The model fit is still acceptable when they are added as well. These results are also available from the corresponding author upon request.

- c. The appendix details the indicators (items) of each factor. In order to scale the factors, one indicator per factor was assigned a fixed unstandardized loading of 1.0 and can therefore not be tested for statistical significance (Kline, 2010). All other indicators load significantly on their respective factor ($p < 0.001$).
- d. Standardized estimates are reported.
- e. Model fit: $\chi^2 = 444.02$ with 372 d.f., $p < 0.01$; GFI = 0.89; AGFI = 0.85; NFI = 0.85; NNFI = 0.96; CFI = 0.97; RMSEA = 0.03.
- f. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed test).

Discussion and Conclusion

Our paper has analyzed the influence of formal organizational architecture on the extent to which a focal subsidiary creates competence that is leveraged by and proves “useful” to other MNC units. Adopting a motivation theory perspective, we argued that an appropriate organizational architecture induces subsidiary creation of such competence by stimulating the subsidiary’s motivation to develop it. The findings unanimously support our account. They suggest that a subsidiary will create more internationally “useful” competence if its mission emphasizes home-base augmenting objectives, if formal interfaces to other MNC units are implemented at its site, and if it is granted little strategic, but much operational autonomy. These findings have several important implications for theory and management practice, especially since parent firm and subsidiary managers can actively influence the organizational architecture (Birkinshaw & Hood, 1998; Ghoshal et al., 1994).

First of all, our study complements the extant literature which frequently highlights the advantages that a decentralized creation of internationally leveraged competence offers. In comparison, we know relatively little about the organizational architecture by which MNCs can achieve these advantages (Fey & Furu, 2008; Nielsen & Michailova, 2007). In particular, the effects of specific organizational elements on subsidiary competence creation have usually not been well understood. Responding to these observations and to repeated calls for further research along these lines (e.g., Foss & Pedersen, 2004; Gulati et al., 2009; Rugman & Verbeke, 2001),

our paper develops our understanding of such specific effects. It resolves inconsistencies among previous findings and provides additional insights into promising organizational elements. Previously, Yang et al. (2008) did not find a positive effect of a home-base augmenting mission on subsidiary-to-parent knowledge transfers and attributed this deviation from their theoretical expectation to their empirical focus on subsidiaries in the start-up phase. Indeed, our examination of subsidiaries of various ages leads to the theoretically expected results and thus corroborates the importance of the objectives specified in the subsidiary's mission. Previous research also highlights a need to establish the effectiveness of additional boundary-spanning mechanisms as these mechanisms can be very powerful, but some prove ineffective (Björkman et al., 2004; Gupta & Govindarajan, 2000). We find that formal cross-unit interfaces (e.g., liaison positions and cross-unit meetings) can significantly enhance subsidiary competence creation, substantiating previous assessments of their effectiveness vis-à-vis knowledge transfer (Gupta & Govindarajan, 2000; Rabbiosi, 2011). Overall, such cross-unit interfaces seem to be promising means to increase competence creation and leverage. Moreover, distinguishing conceptually and empirically between strategic and operational autonomy allows us to address the frequently highlighted conflict between the subsidiary's freedom to create competence and the coordination necessary to leverage it globally (e.g., Birkinshaw et al., 1998; Persaud, 2005). As we observe opposite effects for these two facets of autonomy, the differentiation between strategic and operational autonomy could at least partly explain why the overall findings regarding autonomy are inconsistent and unclear (e.g., Ciabuschi et al., 2010; Gupta & Govindarajan, 2000; Ghoshal et al., 1994). Advancing this differentiation, our findings respond to the repeated call for a better understanding of the autonomy construct (Ambos & Schlegelmilch, 2007; Young & Tavares, 2004). While this distinction has been suggested before (e.g., Glaister et al., 2003; Nobel &

Birkinshaw, 1998), this paper is among the first to explicitly formulate separate hypotheses for strategic and operational autonomy. Our insights should pave the way for future research to further enhance our understanding of autonomy.

Our focus on subsidiary creation of internationally leveraged and “useful” competence, rather than any competence, also has important implications. Not every competence a subsidiary develops is leveraged internationally (Monteiro et al., 2008), but without international leverage, the competence’s contribution to the MNC’s competitive advantage is typically limited (Meyer et al., 2011; Mudambi & Pedersen, 2007). Thus, our study cautions managers and theorists alike that a plain focus on competence creation is likely to fall short of what is required to realize the advantages of multinationality. Moreover, our focus complements the more common focus on international competence transfers in important ways. On the one hand, competence can be “useful” to other units without being transferred to them (Rugman & Verbeke, 2001). Our focus can capture those instances, which are likely to be missed by a focus on transfers, and hence provides a fuller account of a competence’s international “usefulness”. On the other hand, a transferred competence need not prove “useful” to the recipient (Haas & Hansen, 2005). For the generation of competitive advantage and value, however, “usefulness” may be more decisive than the sheer quantity of competence transfers (Ambos & Ambos, 2009; Szulanski & Jensen, 2006). Our focus and our associated dependent variable incorporate these points and can therefore help to develop this important line of inquiry.

Managerial Implications

Our study also reveals multiple useful insights for executives. First, it points towards organizational levers which managers can pull to promote subsidiary creation of internationally

“useful” competence. So far, the academic literature has left executives without much consistent advice on this topic (Foss & Pedersen, 2004). This is unfortunate as executives are highly interested in related findings (Foss et al., 2010). Such advice should be useful to many firms, given that subsidiaries in many MNCs do not develop such competence extensively (Benito et al., 2003; Doz et al., 2006; Rugman, 2005). Our study contributes to the advice we can offer to these firms.

Moreover, we find that an appropriate organizational architecture can harness subsidiaries’ self-interest to create internationally “useful” competence. Parent firm managers could therefore review and adjust monitoring devices and reward systems, which control subsidiary behavior, to minimize costs and potential adverse effects on motivation (Falk & Kosfeld, 2006; Osterloh & Frey, 2000).

Subsidiary managers may conclude from our study that, given an appropriate organizational architecture, creating internationally “useful” competence can be in their subsidiary’s own interest. If they wish to take initiative and to lobby parent firm managers in order to create more competence, our study will show them what organizational elements they might strive to influence.¹⁹ Furthermore, our results suggest that a subsidiary’s strategic autonomy frequently leads to its isolation from the rest of the MNC. Since it can profit from creating internationally leveraged competence (Keupp et al., 2011), our study cautions subsidiary managers against letting the freedom they are granted detach them from the global organization.²⁰ Finally, other units in search of “useful” competence can take the identified

¹⁹ We are grateful to an anonymous reviewer and to the participants of the special issue workshop for pointing our attention to this issue.

²⁰ We thank an anonymous reviewer for pointing our attention to this issue.

organizational elements as a signal of which subsidiaries are likely able to offer such competence.

Limitations and Paths for Future Research

Our study also opens up some paths for future research. First, MNCs' organizational architecture is an important issue for further research on the "eclectic paradigm" (Rugman & Verbeke, 2003). The firm's ability to *organize* knowledge, competence, and related assets effectively throughout the world has become one of the most important firm-specific advantages (Dunning, 2000, emphasis added). Further, internalization advantages fundamentally depend on this ability (Rugman & Verbeke, 1992). Scholars could use our insights to develop the literature on the eclectic paradigm by an analysis of specific organizational elements.

Second, future research could address the limitations of our study. On the one hand, our study shares the common limitation that a cross-sectional design only allows to infer association, not causality. While the proposed direction of influence is supported by substantial theoretical reasons and anecdotal evidence (Foss & Pedersen, 2004), organizational architecture and competence creation could be interdependent so that the reverse direction might hold as well (Keupp et al., 2012).²¹ Future efforts could deploy longitudinal research designs to address the question of causality more comprehensively. On the other hand, we operationalized our variables by shared-level constructs from individual respondents. While multiple procedures suggested the absence of significant subjective bias, future research may complement our work with archival measures.

²¹ We are grateful to an anonymous reviewer for pointing our attention towards this issue.

Third, we examined MNCs' current organizational architecture, whereas the process and history of how it was set was beyond our scope. As subsidiaries can try to influence that, it would be interesting to know how big their influence tends to be.

Finally, future research could test whether our findings generalize beyond international business, since the influence of organizational architecture on intra-organizational leverage of dispersed competence is also an important research gap and source of inconsistencies in the strategic management literature (Foss et al., 2010).

Acknowledgments

We thank LRP's Guest Editors, Rajneesh Narula and Alan Rugman, two anonymous reviewers, the participants of the special issue workshop, as well as Dietmar Grichnik, Christoph Lechner, and Thomas Zellweger for valuable comments. Research assistance by Naomi Haefner is also gratefully acknowledged. An earlier version of this manuscript was a finalist for the SMS Special Conference Singapore Best Paper Prize (2012).

Appendix: Detailed Account of the Study's Measures²²

All items composing the following scales were measured on Likert scales ranging from 1 to 7.

Creation of internationally “useful” competence (Cronbach’s alpha = 0.8555). *To which extent does the following apply? ‘1’ means ‘not at all’, ‘7’ ‘to a great extent’*: (CC1) Our subsidiary has developed information and know-how that was also applied in other MNC units (other subsidiaries/our parent firm); (CC2) Our subsidiary created competencies that were useful in other MNC units (other subsidiaries/our parent firm). *How often does the following occur? ‘1’ means ‘never’, ‘7’ ‘very often’*: (CC3) Our technological expertise is demanded by other MNC units (other subsidiaries/our parent firm); (CC4) If we would not provide our competencies, there would be serious trouble for other MNC units (other subsidiaries/our parent firm).

Home-base augmenting (HBA) mission (alpha = 0.8626). *To what degree are the following motives present in your subsidiary’s mission? ‘1’ means ‘not present at all’, ‘7’ ‘highly present’*: (HBA1) To explore new technological opportunities; (HBA2) To collaborate with specialized local universities or firms; (HBA3) To take advantage of a better R&D environment in this country; (HBA4) To generate specialized technological know-how.

²² The questionnaire allowed respondents to provide separate ratings for the parent firm and other subsidiaries on items that capture the ‘creation of internationally ‘useful’ competence’ and ‘cross-unit interfaces’. To reflect other MNC units as a whole, the analyses presented here combine the separate ratings by adding the corresponding values and dividing the sum by two. When individual regression models for other subsidiaries and the parent firm are run instead of joint analyses, the ‘other subsidiaries’ case provides support for all hypotheses at $p < 0.05$ or better (as the joint model does), while the ‘parent firm’ case supports H1 and H2, but not H3a and H3b (coefficients in expected direction, but insignificant). Since respondents who provided information for both cases have one parent firm and one or more sister subsidiaries, assigning an equal weight to both cases (as we did) is thus the most conservative approach to a joint evaluation of other MNC units as a whole. Detailed results for the individual models are available upon request.

Cross-unit interfaces ($\alpha = 0.7589$). *How often does the following occur? '1' means 'never', '7' 'very often':* (CUI1) We employ personnel to coordinate decisions with other MNC units (other subsidiaries/our parent firm); (CUI2) Subsidiary managers have a mentor who is based at another MNC unit (other subsidiaries/our parent firm); (CUI3) Our meetings are attended by managers from other MNC units (other subsidiaries/our parent firm); (CUI4) We have job rotation programs with other MNC units (other subsidiaries/our parent firm).

Strategic autonomy ($\alpha = 0.7055$). *Who makes the decisions regarding the following points? '1' means 'parent alone decides' and '7' 'subsidiary alone decides':* (SA1) Overall direction of the subsidiary's activities; (SA2) Which new projects to pursue; (SA3) Product design.

Operational autonomy ($\alpha = 0.7357$). *Who makes the decisions regarding the following points? '1' means 'parent alone decides' and '7' 'subsidiary alone decides':* (OA1) Hiring and firing senior staff; (OA2) Cooperation with other subsidiaries in the firm; (OA3) Training programs for subsidiary staff; (OA4) Salary level of subsidiary employees; (OA5) Transfer of subsidiary staff between units.

Codifiability of competence ($\alpha = 0.7963$). *How do you agree to the following statements? '1' means 'strongly disagree', '7' means 'strongly agree':* (COD1) The way our technology works can easily be described in manuals; (COD2) New staff can easily learn about our activities by talking to skilled employees; (COD3) Training new personnel is typically a quick and easy job for us.

Observability of competence ($\alpha = 0.7894$). *How do you agree to the following statements?*

'1' means 'strongly disagree', '7' means 'strongly agree': (OBS1) Competitors could learn about our technology by observing our employees; (OBS2) Competitors could learn about our technology by taking a tour of our facilities; (OBS3) Competitors could learn how to manufacture our products by examining our machines and equipment.

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