

How to control knowledgeable subsidiaries

Abstract

This study focuses on control mechanisms used in multinational corporations (MNCs) to manage their foreign subsidiaries. Drawing on both resource dependency theory and agency theory we develop and empirically test a set of hypotheses aiming at exploring a) how subsidiaries can gain autonomy within the MNC based on its valuable knowledge and b) what control mechanisms the headquarters can employ to ensure efficient coordination in autonomous foreign units. Data collected from 193 Europe-based subsidiaries of American, European and Asian MNCs serve to test these hypotheses. In line with resource dependency theory, our results highlight that depending on the type of knowledge, unique subsidiary knowledge can lead to an increase in autonomy. Furthermore we find that output and input control are effective means of HQ coordination in autonomous subsidiaries.

INTRODUCTION

In the light of global competitive conditions, international management research has witnessed a shift away from a dyadic, hierarchical view of the MNC towards a more network based view (O'Donnel, 2000). A web of diverse and differentiated intra-firm relationships as examined through the lens of evolutionary theory (Kogut & Zander, 1993), learning theory (Hedlund, 1986), or network theory (Ghoshal & Bartlett, 1990), suggests that the organization as a whole can potentially greatly benefit from transferring resources originally developed at different and internationally dispersed locations throughout the entire network. Such global dispersion of knowledge inevitably affects the balance of power between the headquarters (HQ) and the subsidiaries and there is ample scholarly evidence that knowledge creating units can gain considerable autonomy (and/or influence) within an MNC (Bouquet & Birkinshaw, 2008; Prahalad & Doz, 1981). Subsidiary autonomy decreases information overload at the HQ level and enhances motivation, knowledge generation and innovation at the subsidiary level (Birkinshaw, 1999; Birkinshaw & Hood, 1998), which are much sought after sources of competitive advantage (Barney, 1991; Grant, 1996b). Indeed, the knowledge based view of the firm sees knowledge uniqueness as fundamental for a firm's sustained ability to compete (Grant, 1996a; Turner & Makhija, 2006). While some decision making authority of local units may therefore be a strategic imperative for MNCs, allowing them to benefit from innovation and learning on a local level, maintaining control of dispersed and far-flung knowledge creating units has been a seminal challenge for MNCs (Ambos & Schlegelmilch, 2007; Andersson & Forsgren, 1996; Bartlett & Ghoshal, 1989; Nobel & Birkinshaw, 1998; O'Donnel, 2000). As the HQ still needs to ensure some predictability in order to efficiently coordinate resources within the MNC (Egelhoff, 1984), it faces a dilemma of forces calling for both, centralization and subsidiary autonomy at the same time.

We attempt to address this issue by drawing on resource dependency theory and agency theory, and by empirically scrutinizing how knowledge influences a subsidiary's autonomy and how the headquarters manage to maintain some control in highly autonomous units. Control over critical resources plays a central role in gaining power within organizations (Pfeffer, 1981). Typically the HQs possess such resources based on which they reinforce their hierarchical power. At the same time, subsidiaries possess some power sources (e.g. knowledge of specific local contexts) that can increase their decision making authority. While subsidiary autonomy is of strategic importance since it is crucial for motivation and

innovation within the MNC (Birkinshaw et al., 1998), centralization of decision making at the HQ level increases the MNCs predictability and efficiency (Egelhoff, 1984). The HQ can attempt to solve this dilemma by granting some decision making authority to subsidiaries while at the same time limiting them by employing other types of control mechanisms than centralization.

Despite of an ongoing and widely held discussion on how to best coordinate and control foreign subsidiaries only few insights have endured time. While many authors have argued that with increasing complexity, power changes within the network, as well as insurmountable information asymmetries will all lead to a shift from more direct to more indirect forms of control (Doz and Prahalad, 1981; Martinez and Jarillo, 1989), empirical results are mixed (i.e. Ambos and Reitsperger, 2004; Egelhoff, 1991; Gencturk & Aulakh, 1995; O'Donnel, 2001). Scholars primarily draw on the strategy/structure framework and contingency theory, and there is only a limited use of other perspectives from organization theory.

Drawing on Agency theory and Resource Dependency theory, we attempt to shed light on the dynamics of autonomous subsidiaries and control in the MNC. Both theories acknowledge that the two parties of the dyad can possess power sources, e.g. knowledge, and, more importantly, that their goals are not necessarily aligned. However, they do have slightly differing foci: While Agency theory takes a hierarchical view and clearly acknowledges the centrality of the HQ position and its need to control and coordinate the subsidiaries, resource dependency theory recognizes various sources of subsidiary authority and its effects within the MNC and on the HQ-subsidiary relations. Therefore our research questions are: How does subsidiary knowledge affect their decision-making autonomy and what control mechanisms do the headquarters employ in order to balance subsidiary autonomy?

THEORETICAL FRAMEWORK

The concept of autonomy

Autonomy and decentralization are often used as synonyms and centralization is often used as an antonym (Garnier, 1982; O'Donnel, 2000). While centralization frequently refers to the concentration of decision making authority at the HQ level, subsidiary autonomy entails that decision making rights remain at the unit's level (Ghoshal, Korine, & Szulanski, 1994). Sometimes, the concept of autonomy is split further into strategic and operational autonomy (Edwards, Ahmad, & Moss, 2002; Hedlund, 1981). This implies that the HQ is in charge for strategic decisions and only delegates decisions to the subsidiaries on an operational level. This might, however, be misleading as it suggests that all decisions made at the HQ level are automatically strategic and vice-versa. Therefore, some scholars prefer an overall index of autonomy (e.g. Garnier, 1982, Taggart & Hood, 1999), which is also used in the present study.

Previous research on subsidiary autonomy evolved from a focus on the MNC as a whole and moved towards subsidiary characteristics (Paterson & Brock, 2002). Early research is dominated by the strategy/structure framework with a focus on MNC characteristics, such as the degree of internationalization and size but empirical results are mixed (Gates & Egelhoff, 1986) (Hedlund, 1981). Other MNCs characteristics such as nationality and strategy are found to have an impact on subsidiary autonomy: Scholars have shown that Anglo-Saxon subsidiaries are commonly less autonomous than their Asian or Western European counterparts (Edwards et al., 2002; Harrison, McKinnon, Panchapakesan, & Leung, 1994; Harzing, 1999) and multi-domestic MNCs seem to have more autonomous subsidiaries than transnational ones (Roth, Schweiger, & Morrison, 1991). With an increasing use of contingency theory scholarly attention shifted towards subsidiary characteristics, starting with structural variables such as size (Cray, 1984) (Hedlund, 1981), age (Egelhoff, 1984; Youssef, 1975) and establishment mode (Andersson et al., 1996). While the effects of size remain inconclusive, age is largely showing a positive relation to subsidiary autonomy. Similarly, greenfields are often less autonomous than acquired units. More recently, different subsidiary roles and developments have been analyzed (Birkinshaw et al., 1998; Frost, Birkinshaw, & Ensign, 2002) showing that subsidiaries with a local market mandate tend to be more autonomous than subsidiaries with a more regional or global responsibilities. Hence findings

on subsidiary roles seem to be in line with findings on strategy where multi-domestic MNCs tend to have more autonomous subsidiaries.

The described turn in research focus from MNC characteristics, headquarters-subsidiary relationships to subsidiary characteristics and capabilities underscores a shift in the MNC perception towards a view of the MNCs as a network of semi-autonomous units, which are able to develop their own capabilities leaving the HQ struggling for control (Ghoshal et al., 1990; Hedlund, 1986). While most literature on control does not question the assumption that it is in fact possible to control an organization, this cannot be taken for granted when single units have distinct capabilities which are important for the MNC as a whole, e.g. by providing unique and valuable knowledge or expertise (Knights & McCabe, 1999).

Knowledge as a source of autonomy

According to Astley and Sachdeva (Astley & Sachdeva, 1984) a subsidiary's structural power is based on three pillars: 'formal authority', based on the formal hierarchical position, the 'stock of critical knowledge', which is the capacity to control and supply critical valuable knowledge for other units, and 'network centrality', referring to the central position within an organizations workflow (Astley and Sachdeva, 1984:105). If a subsidiary has valuable knowledge, the HQ faces a dilemma, since it can only sustain control as long as it possesses that unique knowledge itself, if it lacks the latter control gets difficult if not impossible (Otterbeck, 1981). Although the HQ may still ask the subsidiary to share its valuable knowledge, enforcing knowledge sharing might be difficult in practice. Also, resource possession may make a subsidiary less dependent on other players within the MNC network (Thompson, 1967). This implies that having knowledge can lead to a higher degree of independence and bargaining power and autonomy (Mudambi & Navarra, 2004; Pfeffer & Salancik, 1978). Since our focus is on knowledge, we propose that the higher a subsidiary's knowledge is the higher will be its degree of autonomy.

H1: The greater a subsidiaries outflow of valuable knowledge, the higher its degree of autonomy.

Similarly, the more dependent a subsidiary is on resource inflows from the MNC network, the less autonomous it will be. Generating resources implies access to other

resources, and since most subsidiaries are not self-contained they must at least partially rely on others to provide them with needed resources (Pfeffer et al., 1978). The more the subsidiary relies on resources provided from within the MNC network, the more dependent it will be. Consequently, the more a subsidiary sources from external networks, the less dependent it will be on internal players, since it can switch external partners more easily. If a subsidiary is mutually dependent or interdependent, by being a sender and a receiver of resources within the MNC network, scholars have established that subsidiary autonomy suffers (Garnier, 1982; Harzing, 1999; O'Donnel, 2000). Interdependencies require coordinated efforts among all MNC units therefore resulting in pooled decision making.

H2: The greater a subsidiary's resource inflows, the less autonomous it will be.

Control in MNCs

In an MNC context, scholars have been eager to point out the pivotal role of headquarters' coordination and control in implementing global strategies (Doz and Prahalad, 1981; Bartlett and Ghoshal, 1989; Kogut, 1985; Andersson and Forsgren, 1996). Control has been usually defined as any process (mechanism, instrument or strategy) applied by the organization to assure the execution of organizational goals and plans (Tannenbaum, 1968; Child, 1973). The control strategies available to firms have been widely discussed in the literature (i.e. Eisenhardt, 1985; Ouchi, 1977, 1979; Martinez and Jarillo, 1989, 1991; Ghoshal and Nohria, 1989; Bartlett and Ghoshal, 1989; Nobel and Birkinshaw, 1998; Gupta and Govindarajan, 1991). Conventional organizational theory suggests aligning control strategies with task characteristics (Ouchi's 1979; Thomson, 1967; Perrow, 1970; Williamson, 1975), arguing further, that low task programmability, and low outcome measurability, will lead to a shift from behavior (or central control) to socialization (or clan control).

Control has been classified in a number of ways, and can be categorized in output control versus behavior control (Eisenhardt, 1985, Ouchi, 1977). However this distinction might be misleading, as all control mechanisms essentially aim at altering behavior (Harzing, 1999). Following, Martinez & Jarillo (1989), Harzing (1999), O'Donnel (2000), Kim (2003) and Nohria & Ghoshal (1994) control can be broken down into four broad categories: centralization, output control, formalization and socialization. Centralization (e.g. Alexander,

1991, Child, 1972, 1973, Pugh et al. 1968) refers to decision making authority being located at higher levels of the organizational hierarchy hence decision making authority is pooled at the HQ level. Therefore, centralization can be seen as the opposite of subsidiary autonomy and cannot be used to govern highly autonomous units. Formalization (e.g. Goshal & Nohria, 1989, Child 1972, Nobel and Birkinshaw, 1998, Calori et al. 1994) refers to the use of written procedures, policies, standard rules and instructions distributed from the HQ to the subsidiaries. Output control/Management by Objectives measures performance and the desired quality and quantity of output of subsidiaries by rather detailed reporting systems (e.g. Chang & Taylor, 1999, O'Donnel, 1999, Martinez & Jarillo 1989) and implicitly poses the threat of repercussions if the desired output levels are not met. Often output control is combined with performance incentives on the management level. Socialization strives to align values and practices of the HQ and the subsidiaries often by infusing organizational culture throughout the MNC (e.g. Nohria & Goshal 1994, Edström and Galbraith 1977, Ferner 2000, Gupta & Govindarajan 1991, Nobel & Birkinshaw 1998, Parsons, 1956). Socialization mechanisms include mutual visits between HQ and subsidiaries, management training, teams, etc. Moreover, since expatriate control can be used as a means of both centralization and socialization, we introduce this construct separately. Personal control refers to the use of expatriates in foreign subsidiaries. Expatriates are trusted managers who do represent corporate norms and values of the HQ. They are often seen as a centralization mechanism (Marschan et al. 1996, Harzing, 1999) or as a form of monitoring (O'Donnel, 2000) (Boyacigiller, 1990). At the same time they can be seen as a socialization mechanism in their function of diffusing organizational values and practices (Baliga & Jäger, 1984, Fenwick et al. 1999). Furthermore, we distinguish input control, where HQ carefully selects and trains subsidiary employees in order to ensure ex-ante consistency with HQ policies.

An agency perspective on control in autonomous subsidiaries

The notion of choice between different control strategies is also central to agency theory, which predicts that firms will determine the optimal control strategy as a function of uncertainty, risk, and relative monitoring costs (Eisenhardt, 1985, 1989; Gencturk & Aulakh, 1995). Agency theory has been a dominant paradigm in organizational theory e.g. (Davis, Schoorman, & Donaldson, 1997) and has been widely used in management research and more recently in the field of international management e.g. (Sanders & Carpenter, 1998; Sharp & Salter, 1997). In its core, agency theory is directed at resolving agency relationships ‘in which

one party (the principal) delegates work to another party (the agent), who performs that work (Eisenhardt, 1989)' under the assumption of self-interest, risk aversion, and opportunism. Agency problems arise because of diverging interests and information asymmetry between principal and agent (Jensen & Meckling, 1976).

We apply Agency theory to HQ subsidiary relationship to develop hypothesis regarding foreign subsidiary control in autonomous subsidiaries. Foreign subsidiaries are of increasing strategic importance for the overall performance of MNCs (Gupta & Govindarajan, 1991; Werner, 2002). A critical challenge of MNCs is how these subsidiaries can best be controlled to foster needed local differentiation, and world-wide diffusion of innovations within the multinational network of subsidiaries (Bartlett et al., 1989). For this purpose, it is helpful to view the MNC as a network of principal-agent relationships between the HQ and foreign subsidiaries. The HQ decision-makers, principals, aim to expand the company into foreign markets with help of agents in the form of foreign subsidiary decision-makers. From an agency perspective, the HQ delegate responsibilities and some decision making authority to the subsidiary management. Such a relationship can create agency problems because the HQ and subsidiary goals might be incongruent, and foreign subsidiaries may exploit information asymmetry. As such, relationships between the HQ and the foreign subsidiaries form a familiar principal-agent relationship. Agency problems can be resolved by monitoring subsidiaries, which limits the agent's scope of self-interested behavior, or by incentives, which help to align interests between head offices and subsidiaries (Jensen & Meckling, 1976).

Agency theory postulates that centralization of decision making is seminal for the MNC in that it ascertains that all subsidiary activities are in accordance with the overall strategy of the MNC (Child, 1977). As the subsidiary becomes more autonomous the HQ must rely on other mechanisms in order to decrease agency problems (information asymmetry and moral hazard) (Jensen & Meckling, 1976). Hence, we expect subsidiaries with high decision making autonomy to be controlled by other control mechanisms than centralization.

Control should be seen "in the context of ever present tensions between subsidiaries and headquarters" (Prahalad et al., 1981):191 and that "the harmony of any configuration of control elements relies on specific situational requirement" (Cardinal, Sitkin, & Long, 2004):412 based on (March, 1988; Sutcliffe, Sitkin, & Browning, 2000). As the resources

possessed by the subsidiary increase, the efficacy of centralization decreases as subsidiaries are likely to overt to hierarchical control. At the same time, subsidiaries are more receptive to impersonal rules and procedures installed by the HQ in order to keep agency problems in check (Nohria and Goshal, 1994). With greater subsidiary autonomy subsidiary managers have greater discretion, making direct monitoring of behavior difficult. Thus, the HQ needs to adjust its control strategy accordingly.

If monitoring costs are high, firms are expected to opt for behavior control or socialization that supposedly eliminates goal conflict in the first place (Eisenhardt 1989). Alternatively, HQ may use output control (e.g. management by objectives) by introducing set goals, to eliminate goal conflict by giving subsidiaries leeway in how to reach the set goals. Output control entails different measures of output, such as profits, productivity, sales, etc. that the subsidiary is required to report to the HQ. By communicating the required measures and set performance goals to the subsidiary the HQ clearly sets the agenda and the subsidiary will seek to meet the specified goals. Although agency theory suggests that without close supervision, output control might lead to information asymmetries (Snell, 1992), or to withholding information from the parent resulting in a control loss (Williamson, 1975), elaborate information systems and rewards for achieved results can counteract this (Kerr, 1985). By introducing incentive-based pay, subsidiary management will be more motivated to achieve set performance targets, which will decrease goal conflict. Hence some authors use the term “management by objectives” to underscore that subsidiary management is granted more autonomy on how to achieve those outcomes (Lawler & Rhode, 1976). Although empirical findings on the use of output control are mixed (e.g. Harzing, 1999, Chang & Taylor, 1999, O’Donnel, 2000), which might be due to the combined with other control mechanisms, we argue that based on agency theory output control will be positively related to high subsidiary autonomy.

H 3: The HQ will use output control (management by objectives) to a great extent in highly autonomous subsidiaries

However, output control has its drawbacks: First, it only looks at outputs and does not provide information on the means of how an output is achieved or not. Second, output control is reactive since there is no mechanism counteracting mistakes before they occur. Third, it can elicit myopic behavior having agents pursue only some goals at the costs of others (Snell,

1992). Lastly, output control might render ineffective in situations of high environmental uncertainty. Hence, HQs may resort to socialization. Socializing organizational members to have a common set of values and goals minimizes interest divergence and enhances a sense of mutual interdependence (Barnard, 1968; Eisenhardt, 1985; Nohria & Ghoshal, 1994), or as Ouchi (1980):138 puts it: “common values and beliefs provide the harmony of interests and erase the possibility of opportunistic behavior”. Creating shared values and beliefs among subsidiary managers increases the likelihood that subsidiaries will use their specific knowledge and resources in order to pursue the interests of the MNC as a whole rather than their possibly diverging own ones (Nohria et al., 1994). The HQ therefore emphasizes management training and MNC wide rotation of personnel and fosters informal communication with its subsidiaries. By doing so, it aims to establish trust and reciprocity within the hierarchy (Nohria & Ghoshal, 1994). In short, agency issues are addressed by aligning the HQ and subsidiaries interests by establishing shared values and to counteract information asymmetries by effective informal communication channels.

Similarly, building on the relative power of the subsidiary, resource dependency theory (Pfeffer, 1981; Prahalad et al., 1981), suggests that increasing subsidiary power leads to more subtle forms of control (Ambos et al., 2007). The common characteristics of the highly autonomous subsidiaries which follow independent yet partly interdependent goals (Mudambi et al., 2004) have scholars suggest a shift from more central and behavioral forms of control towards social control. (see Martinez and Jarillo (1989). Such predictions were underscored by emerging work of Bartlett and Ghoshal (1989) and others who suggested that the MNC should shift in total towards more network-like structures kept together by a common mindset. By establishing a shared set of norms and values (Parsons, 1956) across MNC units, the parent makes sure that headquarters and subsidiary interests are aligned without any direct interference by the headquarters. Given the increase in complexity in MNCs due to an increased concentration in its operating environment this reasoning seems plausible. Although empirical findings on the effectiveness of social control are rather mixed, we postulate that autonomous subsidiaries can be controlled by socialization.

H 4: The HQ will use socialization/normative integration to a great extent in autonomous subsidiaries

Additionally or alternatively, the HQ can put a trusted person in charge of the subsidiary if it cannot directly interfere in decision making. By doing so, the HQ ensures that a subsidiaries stock of critical knowledge and resources stays on the HQs radar, without having to meddle in subsidiary affairs directly. We use expatriate control as a separate construct since some scholars argue that expatriates might be used as a means of monitoring (O'Donnel, 2000), while others argue, that expatriates are used as a means of socialization (Baliga & Jäger, 1984, Fenwick et al. 1999)

H5: The HQ will use expatriates in autonomous subsidiaries

Furthermore, we distinguish input control, which allows the HQ to align subsidiary interests with its own by selection and training (Snell, 1992). The use of selection and training as a control mechanism has been given many names, “input control” (Baliga & Jaeger, 1984), “clan control” (Ouchi, 1979), “skill-standardization” (Mintzberg, 1979), “ex-ante control” (Flamholtz, 1979) but can be clearly distinguished from the construct normative integration, since its focuses is on an ex-ante control of inputs. Input control “regulates the antecedent conditions of performance – the knowledge, skills, abilities, values, and motives of employees” (Snell, 1992):297. Careful staffing and training can prevent goal conflicts and information asymmetries but it only manages potential, there is no guarantee on what might actually happen. In otherwise highly autonomous subsidiaries, input control can prevent agency problems.

H6: The HQ will use input control in autonomous subsidiaries

Lastly, the HQ can resort to behavior control in order to monitor subsidiaries by structuring the transformation process of work (Ouchi, 1977). To ensure adherence of subordinates to prescribed procedures, the HQ closely monitors and evaluates subordinates' actions over time. However, as the resources possessed by the subsidiary and thereby subsidiary autonomy increases, subsidiary managers have greater discretion, and direct monitoring of behavior difficult. Therefore we propose, that the more autonomous a subsidiary gets, the less the HQ will use behavior control.

H6: The HQ will not use behavior control in autonomous subsidiaries.

METHODS

Sampling and data collection procedure

This study addresses the mechanisms the HQ use to control autonomous subsidiaries. Hence, the key informant was the subsidiary manager. The sample consisted of foreign subsidiaries located in Europe with a European, an American, or an Asian parent. Based on the AMADEUS database our sample frame included subsidiaries with at least 50 employees, excluding small and micro enterprises (Union, 2003), that were established no later than 2006, resulting in 46,421 subsidiaries. A random sample of 1900 subsidiaries was drawn and adjusted for subsidiaries established as joint ventures, and for subsidiaries having individuals as main shareholders, and for subsidiaries which did not qualify as manufacturing industries. By doing so we achieved a final sample of 1900 medium and large subsidiaries varying in terms of manufacturing industries, size and age.

A mail questionnaire was sent to the subsidiary based executive after we established contact with the target subsidiary via phone in order to increase response rates, speed and data quality (Harzing, 2000). Following Dillman (1978) follow-up phone calls to non-respondent were made 2-3 weeks and again after six weeks. The initial and the follow-up mailings yielded 193 usable questionnaires for a response rate of 10,14%. The industry distribution in our sample mirrored the industry distribution of the AMADEUS database. Our final sample consisted of 69% of firms in the manufacturing and mining industry, 29% in trade, and only 4% in services. Responding subsidiaries were located in 22 different European countries, with Germany, Spain, the UK, Poland and France accounting for some 46% of respondents.

Non-response bias was evaluated in two ways: Drawing on Armstrong and Overton (1977) who stated that late respondents profiles do not differ from non-respondents, the responses from the first mailing were compared with the responses from the third mailing by testing for mean differences on all of the variables included in the hypothesis. Since the means of those two groups did not significantly differ from one another, our analysis suggests that non-respondents did not differ significantly from respondents. Furthermore, secondary information concerning the parent company and the foreign subsidiary was also collected for

a randomly picked subset of respondents and non-respondents, and firms did not differ significantly in terms of annual sales or subsidiary size (O'Donnel, 2000).

Measures

Subsidiary autonomy was measured based on a 9-item dichotomous scale slightly adapted from Gupta & Govindarajan (Gupta & Govindarajan, 2000) asking the respondents to state whether the subsidiary or the parent decides on a number of important issues. (5-pt. scale, anchor parent decides 100%; subsidiary decides 100%). The coefficient alpha for this measure was 0.708, indicating an acceptable level of reliability. Subsidiary critical knowledge was measured by a scale adapted from Astley & Zajac (Astley & Zajac, 1990), a factor analysis (oblim rotation) showed loadings on two different factors, which were named marketing/management subsidiary knowledge and product/technological knowledge. KMO of 0.708 indicates good fit and Bartlett's test of Sphericity was highly significant. EFA for resource inflows shows loadings on two factors explaining 62 % of variance, one named marketing/management resource inflows and one named product/technology resource inflows. The KMO factor was 0,67 indicating acceptable fit and Bartlett's test of sphericity was highly significant.

Normative integration was measured by a 5 pt Likert scale based on Martinez & Jarillo (Martinez & Jarillo, 1991) and Harzing (Harzing, 1999). EFA shows that all items are significantly correlated to each other, and the KMO measure of 0.804 shows good fit. All correlations are above 0.77 and Bartlett's test of sphericity was highly significant. Based on oblim rotation we derived one factor explaining 67 % of variance. Output control was measured by a 4 item Likert scale based on Snell (1992). All items loaded on one factor, explaining 63% of variance. KMO is 0,675 and Bartlett's test of sphericity is highly significant. Behavior control was based on an 3 item scale adapted from Snell (1992), and Martinez & Jarillo 1989, 1991. EFA shows that all items loaded on one factor, explaining some 60% of variance. The KMO measure of 0.6 is good and Bartlett's test of sphericity highly significant. Expatriate control was measured by the number of expatriates.

RESULTS

All hypotheses were tested using multiple regression. Summary statistics and correlation coefficients for all of the variables are presented in table 1.

Insert table 1 about here

Hierarchical multiple regression was used to assess the ability of seven measures (subsidiary knowledge outflows, resource inflow, output control, normative integration, expatriates, input control and behavior control) to predict subsidiary autonomy after controlling for subsidiary age, international mandate, formation, on-site facilities, and environmental uncertainty. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. It should be noted from table 1 that two independent variables, input control and normative integration were significantly correlated at 0.797. Thus, it was necessary to examine whether this collinearity had an effect on the model parameter estimations. Hence we respecified the two models alternatively dropping out the two correlated variables to check the sensitivity of the parameter estimates to the model specification and the coefficients remained fairly stable (0.15 – 0.11 and .363 – 0.269 respectively) with no changes in significant levels.

Age, international mandate, formation, scope of activities, and environmental uncertainty were entered in step 1, explaining 2.4 % of variance of subsidiary autonomy. After entering knowledge outflows and resource inflows, the total variance explained by the model as a whole was 10%, $F = 1.095$ (not sign). Next, the five control mechanisms were entered one by one. Adding output control resulted explained 17% of variance, $F=1.926$ ($p < 0.05$). Normative integration only showed an R^2 change of 1%, $F=1.937$ ($p<0.05$). Expatriates lead to an R^2 of 0.194 $F=1.981$ ($p<0.05$). Input control lead to an R^2 change of 4% ($R^2=0.232$). Lastly, behavior control had only a marginal impact on $R^2=0.0239$ $F=2.4$ ($p<0.05$).

All standardized correlation coefficients are shown in table 2. As indicated in table 2, hypothesis 1 was supported for product/technological knowledge, with a beta of 0.388

($p < 0.01$) but not for marketing/management knowledge ($\beta = -0.200$; $p < 0.05$). Based on the EFA on knowledge outflows we split the construct “subsidiary knowledge” into the two constructs product/technological knowledge and marketing/management knowledge beforehand.

Insert table 2 about here

Similarly, before testing hypothesis 2, we split the construct “resource inflow” into inflow of technological resources and inflow of managerial/marketing resources based on EFA. In line with our hypothesis we found a strong significant negative influence of technological resource inflows on subsidiary autonomy ($\beta = -0.229$, $p < 0.05$). However, the opposite was true for the managerial resource inflows which we found to be positively related to subsidiary autonomy ($\beta = 0.170$, $p < 0.01$).

Hypothesis 3 suggesting a positive relation between output control and subsidiary autonomy was fully supported ($\beta = 0.196$, $p < 0.01$). The same is true for Hypothesis 5 which postulates a positive relation between subsidiary autonomy and the use of expatriates ($\beta = 0.153$, $p < 0.05$). Interestingly, the use of input control ($\beta = 0.390$, $p < 0.01$) is found to have the strongest relation with subsidiary autonomy. However, no significant relation could be found for hypothesis 4, suggesting a positive relation between normative integration and subsidiary autonomy. Lastly, our results for hypothesis 6, which posited a negative relation between behavior control and subsidiary autonomy, went into the right direction but were not significant.

DISCUSSION

The objectives of this study were twofold: One goal was to look into how subsidiary knowledge influences autonomy. The other aim was to increase our understanding of what types of control mechanisms the HQ use to manage its foreign subsidiaries in the light of subsidiary autonomy by drawing on both agency theory and resource-dependency theory.

Our results regarding knowledge outflows and autonomy are puzzling at first sight. While our hypothesized relationship between autonomy and knowledge was strongly supported for product/technological knowledge the opposite was found for managerial/marketing knowledge. Consequently, the type of knowledge matters greatly when it comes to using knowledge as a trigger for autonomy. As established by resource dependency theory, for a subsidiary to exploit its autonomy based on knowledge, the latter must be unique and of high value for the HQ (Mudambi et al., 2004). If a subsidiary's knowledge can be generated by other units as well, the HQ can obtain this knowledge elsewhere, and the subsidiary's bargaining position may get undermined. If we apply resource dependency logic to our findings, we may conclude that the marketing/managerial knowledge of our focal subsidiaries might be less unique and might be more easily obtained elsewhere, than technological and production related knowledge. However, given that marketing and management knowledge can be very location specific and more tacit by nature, this may seem counterintuitive. Hence, our findings show that uniqueness of knowledge by itself does not necessarily lead to autonomy, but knowledge must also be of value for the group as a whole. Given that marketing and management knowledge is only valuable within the local subsidiary context and cannot be exploited elsewhere within the MNC, the subsidiary cannot create dependencies based on that knowledge which can lead to autonomy, as shown by our findings. Another possible explanation might be that subsidiaries do indeed enjoy more autonomy when it comes to technological and production innovations because technological innovative capacity is fostered by isolation as found by Ambos and Reitsberger (2004).

Following resource dependency logic further, a subsidiaries' knowledge base depends on the level of ownership it has over its knowledge resources. Our findings on resource inflows, both technological and managerial, on autonomy might shine some light onto that matter: since contrary to our hypotheses managerial/marketing resource inflow was found positively related to subsidiary autonomy, sharing managerial/marketing resources across units may be fostered by HQ policies which might outweigh the autonomy loss suffered by the negative relation between marketing/management knowledge outflows by subsidiaries. Furthermore, we may conclude that the level of subsidiary ownership on marketing/management knowledge was less pronounced, which is reflected by the positive relation between autonomy and marketing/management resource inflow, than for technology/production knowledge. Given that the HQ can only sustain control over knowledge-rich subsidiaries as long as it possesses that knowledge themselves (Otterbeck,

1981), the type of unique knowledge a subsidiary possesses seems to be crucial when it comes to subsidiary autonomy. According to our findings, the HQ might be valuing unique technological/product knowledge more than marketing/managerial knowledge which might not be as easily exploited outside the focal subsidiary. At this point we can only speculate future research on different types of knowledge and their relation to subsidiary autonomy and power will hopefully help to disentangle this phenomenon.

Similarly, the type of resource dependency seems to have an impact on the direction of the relationship between subsidiary autonomy and resource dependency. In line with resource-dependency theory we found that subsidiaries with high inflows on technological and product related resources were less autonomous. However, as described above we did find the opposite effect when it comes to marketing/managerial resources. Contrary to resource dependency logic, we found that marketing/management resource inflows were actually positively related to subsidiary autonomy. Again, it seems that the resource type matters when it comes to intra-group (inter)dependencies.

In line with the theoretical framework of agency we found a positive relation between subsidiary autonomy and output control. It seems that output control indeed reduces goal conflict between the parent and the foreign subsidiary by clearly setting joint goals while at the same time giving some leeway to subsidiaries on how to achieve those goals.

However, contrary to the assumption of agency theory we found no significant relation between the use of normative integration and subsidiary autonomy. This may be due to the fact that the more the HQ and the subsidiary share common objectives and goals the less innovative a subsidiary might be and, hence, the less autonomous it is. A closer look at previous empirical studies shows similar shortcomings in empirical evidence: E.g. Gupta and Govindarajan (1991; 1994) could not find that globally innovating subsidiaries were exposed to high social control; Asawka (1996), also fell short of proving that Japanese R&D units did use normative integration; O'Donnel (2000) did not find empirical support for her hypothesis that headquarters supervision will decrease as lateral centralization – which equals social control – increases. Also our findings questions that normative integration might be a panacea for HQ control in highly autonomous subsidiaries.

Furthermore, our findings underscore that the use of expatriates is indeed related to subsidiary autonomy. Given that we did not find support for normative integration, we may conclude that expatriates are more used as a monitoring device than an integration device. Interestingly, the highest coefficient was found for input control. Hence, parents employ ex-ante mechanisms, such as careful selection and training of employees in order to avoid potential goal conflicts later on. With regards to normative integration which also entails training, we may conclude that parents rather resort to careful recruiting and staffing in the first place, than to training and integration efforts later.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

Several limitations of this study have to be noted that could lead to further research. First, our sample was limited to European based subsidiaries, which may limit generalizability of results. Similarly, since we based our sample on the AMADEUS database which consists mainly of firms in the manufacturing industry, our sample mirrored the industry distribution of the database, with 68% of subsidiaries active in Manufacturing and Mining, 29% in trade, and only 4% in services. Future studies could test whether similar relationships prevail in other national and industry contexts.

Second, using key informants to measure our constructs by means of perceptual measures is subject to common method bias. Further studies may benefit from separating independent and dependent measures across multiple respondents.

Third, we restricted our study to only one construct, namely knowledge, based on which subsidiaries can gain autonomy and controlled for legal mandate. As previously indicated research in sociology, also lists that among other things, legal power and/or network centrality can add to a units power and essentially to its decision making authority. Future studies may attempt to capture all sources of subsidiary power in order to clarify its impact on autonomy more holistically.

Lastly, our results indicate that the type of knowledge matters greatly when it comes to subsidiary autonomy. Future research could shed more light on the various knowledge types and under which conditions they might serve as a basis for subsidiary autonomy or not.

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Table 1: Summary statistics and correlations

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 Autonomy	3.27	.75	1																				
2 Age	1984.88	26.82	-.058	1																			
3 size	524.82	1591.15	.048	-.019	1																		
4 mandate	.44	.50	-.039	-.067	.126 **	1																	
5 SC R&D	.98	1.22	.035	.026	.046	.150 **	1																
6 sc manufacturing	1.54	1.24	.006	.091	.201 ***	.224 ***	.446 ***	1															
7 sc warehouse	1.18	.94	-.034	.043	-.006	.102 **	.435 ***	.425 ***	1														
8 sc service	1.07	.90	-.064	-.043	-.002	.147 **	.407 ***	.193 ***	.595 ***	1													
9 Environuncert.	2.95	.76	-.052	-.027	-.033	.058	.053	-.087	-.036	.064	1												
10 Greenfield	.38	.49	-.010	-.137 ***	-.012	-.026	-.107 *	-.240 ***	-.027	-.071	-.0005	1											
11 Acquisition	.50	.50	.024	.058	.036	-.060	.100 *	.085	.135 **	.171 ***	-.059	-.7341 **	1										
12 Joint venture	.12	.33	-.055	.093	-.041	.089	-.040	.210 ***	-.080	-.107 **	.033	-.2941 **	-.372 ***	1									
13 knowledge mm	2.14	1.25	-.111 **	-.065	-.155 **	.141 **	-.003	-.031	.017	.114 **	.257 ***	.0696	-.184 ***	.150 **	1								
14 knowledge tp	1.90	1.49	.065	.005	-.033	.438 ***	.323 ***	.579 ***	.294 ***	.186 ***	.047	-.3341 **	.134 **	.265 ***	.333 ***	1							
15 resource in tech	2.19	1.48	-.048	-.037	.150 **	.210 **	.019	.268 ***	.034	-.091	-.057	-.2650 **	.156 **	.198 ***	.129 **	.481 ***	1						
16 resource in man	2.58	1.15	.090	-.105 *	-.016	-.111 *	-.038	.013	-.053	-.040	.153 **	.0158	-.146 **	.200 ***	.332 ***	.072	.201 ***	1					
17 output control	3.74	.82	.289 ***	.013	-.096	-.094	-.011	-.043	.037	-.037	-.002	-.0699	.041	.045	-.0334	-.027	-.0681	.082	1				
18 normative integration	3.18	.95	.174 ***	.030	-.025	.003	-.052	-.107 *	-.065	-.036	.161 **	.0457	-.075	.088	.060	.009	.132 **	.259 ***	.283 ***	1			
19 Expatriates	8.26	18.45	.124 **	.032	.045	-.041	-.176 ***	-.184 ***	-.161 **	-.231 ***	-.149 ***	.2216 **	-.216 ***	.044	-.076	-.223 ***	-.092	-.015	.051	.065	1		
20 input control	2.88	1.01	.262 ***	.048	-.103 *	.012 *	.059	-.039	.013	.025	.108 *	.0011	-.061	.125 **	.083	.102 *	.203 ***	.177 ***	.401 ***	.797 ***	-.021	1	
21 Behavior control	2.64	1.14	.165 **	.070	-.032	-.058	-.027	-.096 *	-.114 *	-.099 *	-.066	.0732	-.098	.028	.068	.075	.041	.180 ***	.434 ***	.375 **	.095	0.4429 **	1
N			192	186	186	192	191	191	190	187	190	188	187	188	178	179	184	188	184	180	183	179	180

Table 2: Linear regression models

independent variables	knowledge & res.flows			HQ control mechanisms						
	model 1	model 2	model 3	model 4	model 5	model 6	model 7			
	-									
managing/marketing knowledge outflow	0.167 *	-0.219 **	-0.201 **	-0.190 **	-0.190 **	-0.197 **	-0.200 **			
technological/product knowledge outflow	0.271 **	0.365 ***	0.351 ***	0.346 ***	0.357 ***	0.354 ***	0.388 ***			
resource inflow product/technology		-0.184 *	-0.153 *	-0.171 *	-0.165 *	-0.222 **	-0.229 **			
resource inflow marketing/mmgt		0.184 **	0.152 *	0.127	0.129	0.157 *	0.170 ***			
Output control			0.276 ***	0.243 ***	0.238 ***	0.163 ***	0.196 ***			
Normative integration				0.116	0.110	-0.156	-0.151			
Expatriates					0.126	0.148 *	0.153 **			
Input control						0.362 ***	0.390 ***			
Behavior control							-0.106			
R ²	0.059	0.098	0.170	0.181	0.194	0.232	0.239			
F	0.732	1.095	1.926 **	1.937 **	1.981 **	2.334 ***	2.289 ***			

* p < 0.1; ** p < 0.05; *** p < 0.01
(standardized coefficients)