Strategic Relatedness, Specialized Resources and Multinational Subsidiary Autonomy

Abstract

It is conceptualised that autonomy can be both a cause and an effect of subsidiary development, but little empirical research has been carried out. This study combines the resource-based view and network approaches and investigates the interactive relationships between strategic relatedness, specialized resources and subsidiary autonomy based on a data set of 243 multinational subsidiaries in China. Our results indicate that both internal and external strategic relatedness significantly affect the subsidiary's specialized resources. We also find that subsidiary autonomy significantly affects its external and internal strategic relatedness.

Key words: subsidiary, autonomy, network embeddedness, resource-based view, structural equation model.

1. Introduction

The management of multinational subsidiaries has gradually emerged as a distinct field of research from within the fields of both international and strategic management in the past twenty years or so (Paterson & Brock, 2002). In this particular body of literature, much attention has been devoted to subsidiary autonomy. Autonomy may facilitate a subsidiary's development of independent competences and local adaptation and responsiveness, contributing to both the firm-specific advantages of the multinational enterprise (MNE) and local development in the host country. Therefore, autonomy is a key concept associated with the strategic role and development of a multinational subsidiary (Young and Tavares, 2004).

The research into subsidiary autonomy has so far examined both determinants and effects of autonomy. The former include the mode of entry (Garnier, 1982; Andersson and Forsgren, 1996; Harzing, 1999), subsidiary size and age (Young et al, 1985), multinational enterprise strategy or subsidiary strategic role (Doz, 1986; Prahalad & Doz, 1987), subsidiary initiative (Ghoshal and Bartlett, 1988; Birkinshaw,1996,1997), and internal/external networks or embeddedness (Andersson and Forsgren, 1996; Birkinshaw & Morrison, 1995; Birkinshaw and Hood, 2000; Garnier, 1982; Harzing, 1999; Hedlund, 1981). The latter covers change in network power (Birkinshaw 1995), headquarter control (Birkinshaw, 1998) and resistance to downsizing (Feinberg, 2000). These variables are comprehensively incorporated into the analytical framework of Birkinshaw and Hood (1998) and Paterson & Brock (2002). In this framework, the main drivers of subsidiary development are grouped into the local environment, subsidiary choice and head office controlled mandate. Subsidiary development in turn

leads to environmental effects such as greater local participation and responsiveness, and subsidiary effects such as greater autonomy and such as less direct control from head office.

Although autonomy can be both a prerequisite and a desirable result of subsidiary development (Young and Tavares, 2004), the determinants and effects of autonomy have traditionally been studied separately with very few exceptions. Birkinshaw et al. (1998) use partial least squares techniques to disentangle some cause and effect relationships between subsidiary management, parent-subsidiary relationship (including subsidiary autonomy), business environment, specialized resources, subsidiary initiative and subsidiary contributory role. Taggart and Hood (1999) perform logistic regressions to investigate whether there is a causative relationship between level of autonomy and a range of operational and strategic variables.

The current paper, therefore, focuses on testing the interactive relationship between specialized resources, strategic relatedness and subsidiary autonomy. It combines resource based views and the network approach to link the local environment and resources to a multinational subsidiary's strategic relatedness, specialized resources and autonomy. Following Birkinshaw (1998), specialized resources are defined as subsidiary capabilities (R&D, manufacturing, marketing etc.) relative to other subsidiaries in the MNE. Strategic relatedness includes subsidiary's external relatedness with local partners in the host country and internal relatedness within the MNE. We expect to find an interactive relationship between strategic relatedness, specialized resources and subsidiary autonomy. One of the unique features of this study is to compare the results for the initial year when the subsidiary was formed

with those of the current year (2005) to see if there is any shift in such relationships. The overall results show that the local environment and resources in a host country have a positive impact on a subsidiary's external strategic relatedness. Both internal and external strategic relatedness significantly affect the subsidiary's specialized resources. However, specialized resources do not drive subsidiary's autonomy. Finally, subsidiary autonomy has significant impact on both internal and external strategic relatedness. The paper is organized as follows. Section 2 provides a review of the literature on, and develops hypotheses about the possible interactive relationships between strategic relatedness, specialized resources and subsidiary autonomy. Section 3 describes the data collection and analysis methods. Section 4 presents and discusses the results. Finally, section 5 summarizes the results and discusses managerial implications.

2. Literature Review and Hypothesis Development

There can be a wide range of causes and effects of subsidiary autonomy. This paper examines whether the local investment environment and resources affect a subsidiary's external strategic relatedness with local business partners; whether the subsidiary's internal and external strategic relatedness affects its unique resources; whether the subsidiary's specialized resources influences its autonomy; and whether autonomy in turn affects the subsidiary's strategic relatedness.

2.1. Host country business conditions and a subsidiary's external strategic relatedness

The concept of strategic relatedness is rooted in the network approach to MNE (Hedlund, 1986; Ghoshal & Bartlett, 1990; Harzing, 1999; O'Donnell, 2000). Following this line of thought, an MNE is a differentiated network of internationally dispersed units which are simultaneously embedded in two business contexts: the internal MNE and the external (host country) environment (Andersson et al., 2001; Andersson et al., 2005). Strategic relatedness can be defined as a subsidiary's internal strategic relations with the rest of the MNE and external strategic relations with business partners in the local environment. Each subsidiary maintains unique and idiosyncratic patterns of strategic relatedness and consequently is differentially exposed to new knowledge, ideas and opportunities (McEvily and Zaheer, 1999, Andersson et al., 2002). Therefore, subsidiaries differ substantially in terms of their technological and managerial capabilities (Hedlund, 1986; Ghoshal & Bartlett, 1990; Forsgren & Johanson, 1992; Hedlund & Ridderstrale, 1995; Andersson et al., 2005).

Benito et al. (2003) suggest that host country environment factors include location advantages issues as well as political economy issues, and they have considerable impact on the development of subsidiary roles. In terms of political economy issues, a favourable investment environment such as sound industrial and investment policy encourages an MNE's local linkage activities. For instance, high value-added activities are often supported by high R&D activities and have the tendency to be locally 'sticky'. Thus, strong protection of intellectual property rights in a host country may encourage an MNE engaged in high value-added activities to be embedded with the local milieu with regard to formal or informal linkages with suppliers, customers and domestic institutions (Benito et al. 2003). Therefore, our first hypothesis is:

H1a: A good investment environment encourages a multinational subsidiary's external strategic relatedness with local partners in the host country.

Within a host country's general investment environment, multinational subsidiaries are embedded in different local networks (Ghoshal and Bartlett, 1990; Ghoshal and Nohria, 1997; Forsgren et al, 2000; Andersson et al. 2002). These networks expose MNEs to new knowledge, ideas, and opportunities (McEvily & Zaheer, 1999). Foreign subsidiaries are thereby seen as means to assimilate geographically dispersed resources, capabilities, and competencies and integrate these resources, capabilities, and competencies into the multinational corporation (Schmid and Schurig 2003). In this sense, foreign subsidiaries are considered as critical sources of competitive advantage for the entire MNE (Bartlett & Ghoshal, 1986).

The level of competence is a function of the quality of location advantages that the host location can provide. High competence levels require specific complementary assets that are often associated with agglomeration effects, clusters and the presence of highly specialized skills (Benito et al, 2003). External links with local partners enable a subsidiary to get access to resources and capabilities outside the organization, such as capital, goods, services and innovations (Andersson et al. 2002). Local network partners can play an important role as a source of innovation, new business ideas, and practices (Von Hippel, 1988; Hakansson, 1989; Powell et al., 1996). Competitors can influence competence development by collaborating with the foreign subsidiary in the form of joint ventures or strategic alliances or by provoking the foreign subsidiary to react and imitate a certain behaviour (Chetty and Wilson, 2003;

Schmid and Schuring 2003). As Andersson et al. (2002) argue, such a local network is created through a path-dependent process and is idiosyncratic and difficult to imitate.

Subsidiaries absorb new knowledge from the environment (Porter, 1990; Andersson et al., 1999; McEvily & Zaheer, 1999; Solvell & Birkinshaw, 1999; Schmid and Schuring 2003). A subsidiary's ability to assimilate this new knowledge is heavily dependent on the closeness of its existing relationships with different business partners (Lane and Lubatkin, 1998; Andersson et al. 2002). Therefore, if the knowledge possessed by local partners is identified to be useful for the development of critical capabilities, a multinational subsidiary is expected to make every effort to enhance its strategic links with them. Following this line of argument, our next hypothesis is

H1b: The existence of local partners with useful knowledge encourages a multinational subsidiary to develop external strategic relatedness with them.

2.2. Strategic relatedness and specialized resources

As mentioned earlier, strategic relatedness allows a subsidiary's access to resources from different sources. Actually, differences in embeddedness between an MNC's subsidiaries create differences in their level of competence, which in turn create differences in the roles the subsidiaries can play within the corporate system (Andersson et al, 2001).

In the case of internal strategic relatedness, a subsidiary has the potential to access resources within the MNE. Different from the traditional view that knowledge is

created at and diffused from the headquarters in the home country (Hymer, 1976), the network approach argues that subsidiaries are a part of the MNE that has the capacity to share knowledge across its various units (Bartlett and Ghoshal, 1989). There is actually a tendency for overseas subsidiaries to specialize in developing particular knowledge (Zander, 1997). Thus the subsidiary can be seen to benefit from not just headquarter (and home country) knowledge but also knowledge accessed by other affiliates of the MNC from areas having varied market and technological specialization or resources (Almeida and Phene, 2004). As Young and Tavares (2004) suggest, relationships with partners within the subsidiaries' business networks are critical to the enhancement of capabilities.

A subsidiary's resources in their general terms are the stock of available factors owned or controlled by the subsidiary, and the capabilities existing in the subsidiary. Of particular importance is the way in which these capabilities deploy resources and use organizational processes to achieve growth and shape subsidiary development (Amit and Schoemaker, 1993; Hood and Taggart, 1999). A subsidiary is a heterogeneous bundle of resources within the MNE (Bartlett & Ghoshal, 1989; Ghoshal & Bartlett, 1990, Harzing, 1999; Forsgren & Johanson, 1992, Hedlund & Ridderstrale, 1995; O'Donnell, 2000; Andersson et al., 2005). To develop its unique competences, a subsidiary tends to avoid expending the scare resources attempting to exactly duplicate the parent and other subsidiaries' strategic advantage (White and Poynter, 1984). Put another way, the subsidiary will try to be aware of the resources available elsewhere within the MNE, and develop and possess unique resources or distinctive value-added capabilities (Young and Tavares, 2004).

These unique resources can be called the *specialized* resources (Birkinshaw et al., 1998), as they are superior to those available elsewhere within the MNE. Knowledge flow is believed to be easier to accomplish within organizations than between them (Grant, 1996; Zander and Kogut, 1995). Internal strategic relatedness helps a subsidiary enhance indigenous capabilities in the critical area, and may facilitate the subsidiary develop its specialized resources. Thus, our hypothesis is:

H2a: Internal strategic relatedness has a positive effect on a multinational subsidiary's development of specialized resources.

Galunic and Rodan (1998) suggest that merging of knowledge from different sources is an essential driver of firm innovation and perhaps performance. Actually, the recombination of existing knowledge from different sources to facilitate technological or managerial innovation can be viewed as one of the fundamental functions of an MNC (Kogut and Zander, 1992). While internal embeddedness is an important source of knowledge, external strategic relatedness facilitates a subsidiary to access resources from the local environment (Almeida and Phene, 2004).

A host country was traditionally treated as a potential market or a source of raw materials and a cheap labor force. Recent literature tends to suggest that the location advantages in a host country may include the availability of new knowledge (Dunning, 1994). External non-corporate network partners, including suppliers, customers, distributors, research institutes, professional organizations and regulators and other policy-makers, may play an important role as sources of innovation, new business ideas and practices. Hence, strong embeddedness within external business networks

and industry clusters will enhance capabilities (Young and Tavares, 2004). Empirical evidence from Almeida (1996) suggests that the U.S. subsidiaries of foreign MNCs draw heavily upon the technology of local companies in their knowledge building.

From the above discussion, our second hypothesis can be formulated:

H2b: External strategic relatedness has a positive effect on a multinational subsidiary's development of specialized resources.

2.3. Specialized resources and subsidiary autonomy

It is generally accepted that active development and autonomy allow a multinational subsidiary to increase its influence within a MNC (Forsgren, Holm, & Johanson, 1992), facilitate the formation of global mandates (Birkinshaw & Morrison, 1995), and meet local market requirements in respect of tastes, legislation or host country demands (Young and Tavares, 2004).

However, subsidiary autonomy is not always encouraged by MNE headquarters. Actually, there are sometimes limitations within an MNE on subsidiary autonomy, e.g. the desire to avoid 'reinventing the wheel' and to achieve coordination gains (Doz, 1986; Prahalad & Doz, 1987). Thus, there is a natural tendency for developmental activities such as product and process research to be centralized, usually within the parent firm, and the role of a subsidiary is to pick up these developments and translate them into the local environment. This centralized arrangement does not allow the subsidiary to gain the ability to develop its own response to changes in either the local

or global environment. Hence, the subsidiary may undertake its own development efforts (White and Poynter, 1984).

Prahalad and Doz (1981) suggest that a subsidiary which acquires resources and expertise of its own reduces its dependence on the parent. Such a subsidiary is able to generate independent competencies and hence tends to have greater autonomy (Hedlund, 1981; Taggart & Hood, 1999). As argued by Birkinshaw and Hood (2000), the subsidiary finds itself in a more powerful position vis-a`-vis its parent company because it is in control of valuable local resources. Therefore, specialized resources confer greater autonomy (Birkinshaw & Morrison, 1995). Thus,

H3: A high level of specialized resources leads to a high level of subsidiary autonomy.

2.4. Subsidiary autonomy and strategic relatedness

It must be noted that autonomy is not only a cause but an effect of subsidiary development (Young and & Tavares, 2004). This subsection discusses how a subsidiary's autonomy affects its internal and external strategic links which, as we have seen, can have important impact on the development of its specialized resources.

Ghoshal and Bartlett (1988) indirectly discuss how autonomy might affect internal strategic relatedness of a subsidiary when assessing the impact of autonomy on the creation and diffusion of locally developed innovations. They suggest that subsidiaries with low levels of local autonomy neither create nor diffuse innovations, but tended to

be effective adopters of new products and processes created by the parent companies. In contrast, those relatively autonomous subsidiaries tend to create and diffuse more innovations but are also comparatively more resistant in adopting innovations created elsewhere.

This line of reasoning implies that subsidiary autonomy tends to increase knowledge flows from the subsidiary to the parent and other subsidiaries within an MNE, while reducing its reliance on resources possessed by the rest of the MNE. The reasoning is as follows. Autonomy in its first place allows the freedom to experiment which is necessary for creating innovations (Mohr 1969). Given the condition of normative integration within the MNE, the subsidiary with high autonomy and hence locally developed innovations is expected to diffuse knowledge or competences to the rest of the MNE. With its own capabilities, this subsidiary will tend to learn less from other subsidiaries within the MNE. On the other hand, subsidiaries with low levels of autonomy tend to be very dependent on the capabilities of the HQ as they have neither the authority nor the capability to resist (Ghoshal and Bartlett, 1988). Following this discussion, our next hypothesis is:

H4a: A high level of subsidiary autonomy leads to a low level of internal strategic relatedness in terms of learning from within the MNE.

Turning to external strategic relatedness, as embeddedness in the host country business networks is a strategic resource for performance and competence development (Andersson et al. 2002), a subsidiary has a strong incentive to develop such local links. HQ may have mixed feelings on external linkages of its subsidiaries.

As indicated by Paterson and Brock (2002), one key aspect of the headquarter-subsidiary relationship is how to integrate a portfolio of subsidiaries to maximize their usefulness to headquarters (Picard, 1980). Thus, HQ may encourage its subsidiaries to enhance their competences by developing local linkages. On the other hand, it is difficult for the HQ to direct or control this knowledge acquisition by subsidiaries via their strategic relations with suppliers, customers, distributors, research institutes, professional organizations and regulators and other policy-makers, hence subsidiary autonomy seems necessary (Young and & Tavares, 2004).

As Schmid and Schurig (2003) argue, if it has a specific set of relationships, a subsidiary will normally have a specific role within the MNC (Andersson & Forsgren, 2000; Pahlberg, 2001; Tseng et al., 2002). This subsidiary cannot be managed like all other subsidiaries. Thus, subsidiaries need some autonomy to develop and to make use of their external relationships. Based on the above discussion, our final hypothesis is:

H4b: A high level of subsidiary autonomy leads to a high level of external strategic relatedness in terms of learning from the local environment.

The above discussion suggests that strategic relatedness, specialized resources, and subsidiary autonomy are inter-related. The host country investment environment and locally available resources affect a subsidiary's external strategic relatedness. Both internal and external strategic relatedness facilitate the development of specialized resources which will in turn lead to a high level of autonomy. Finally, subsidiary autonomy has a negative impact on its internal strategic relatedness, but a positive

impact on its external strategic relatedness. These relationships can be summarized by the following conceptual model (see Figure 1).

Insert Figure 1 about here

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3. Research design

3.1. Sample and Measures

The population for this study consists of multinational subsidiaries[1] in China. To prepare a realistic but representative sample, we decided to focus on three cities of China: Chong Qing, Nanjing and Beijing, which are representative of western, eastern coastal and north cities respectively. A list of multinational subsidiaries in these cities was obtained from the local Bureau of Industrial and Commercial Administration, and a sample of 800 subsidiaries was randomly drawn.

We follow the procedures for a survey suggested by de Vaus (2002) to construct and administer our questionnaire. To carry out a pilot study, we conducted interviews of 18 multinational subsidiaries in these three cities during May and June 2006 to test and modify our questionnaire. The postal survey was conducted during June and July 2006. The questionnaire was addressed to the managing director or general manager.

[1] Following Jarillo and Martinez 1990), we define a multinational subsidiary as a firm with at least 50% foreign share in total capital.

The questionnaire prompted the respondents to provide information and their assessment on and the relationships between the host country investment environment, locally available resources, external and internal strategic relatedness, specialized resources and autonomy. The latent variables in the model are measured by multiple indicators. All measures were assessed via a five-point interval scale ranging from 'strongly disagree' to 'strongly agree'. The wording of these measurement items in the questionnaire and their source in the literature are given in Appendix A.

We received 369 completed questionnaires, a figure constituting a response rate of about 43 percent. We examined the possibility of non-response error by comparing the characteristics of the respondents with those of the original sample. There were no statistically significant differences between responding and non-responding firms for foreign share (t =-1.23, p >0.10), or age of the firm (t =0.63, p >0.10)[2].

We excluded the firms established in 2005 from the original sample and hence obtained a sample of 341 subsidiaries. Furthermore, 97 firms were excluded due to incomprehensive information provided in the response. We finally obtained a sample of 243 subsidiaries. Table 1 provides an overview of the final sample. Table 2 presents statistics of selected size and performance variables. Of interest is the observation that there is a great deal of variation in size and performance of firms in the sample.

Moreover, since all measures were collected using the same survey instrument, the possibility of common method bias (CMB) was tested using Harman's one factor test

[2] Ideally a *t*-test should also be conducted in terms of the variables such as size and performance of the firms. Unfortunately we don't have such information about the non-responding firms.

as advised by Podsakoff and Organ (1986)[3]. An unrotated principal components factor analysis on the 20 measurement items for the year of 2005 yielded six factors with eigenvalues greater than 1.0. As several factors instead of one single factor were identified and all of them accounted for just 70% of the total variance, and as the first factor accounted for only 22% of the variance, a substantial amount of common method variance does not seem to be present (Podsakoff and Organ, 1986). Tests on the data of the initial year produced similar results.

Insert Table 1 and 2 about here

3.2. Analytical Method

The method we apply is structural equation modelling (SEM), as it is a powerful approach that simultaneously tests two or more relationships among directly observable and/or unmeasured latent variables involved in the current study. Although SEM serves purposes similar to multiple regression, it has a unique ability to simultaneously examine a series of dependence relationships (where a dependent variable becomes an independent variables in subsequent relationships within the same analysis) while also simultaneously analyzing multiple dependent variable (Joreskog et al., 1999). SEM also has a less restrictive assumption of measurement

[3] The assumption of the test is that if a substantial amount of common method variance exists in the data, a single factor or a general factor that accounts for most of the variance will emerge when all the variables are entered together (Harman, 1967). If the first unrotated factor accounts for a relatively small portion of the total variance (no more than 50%, but the smaller the better), the implication is that CMB is not likely to be a significant problem. Despite of increasing criticism of its insufficiency, Harman's one factor test remains the most commonly used test for CMB.

error as it is based on the assumption that each explanatory and dependent variable is associated with measurement error (Bollen, 1989).

Given SEM's ability to map and assess a web of relationships, it has been widely used in various areas of managerial research. However, reviews of SEM usage in the fields of organizational behaviour (Brannick, 1995), management information systems (Chin, 1998), marketing (Steenkamp and van Trijp, 1991), and strategic management (Shook et al., 2004) have unveiled serious flaws. For example, Shook et al. (2004) coded 83 studies that used SEM, out of which only 3 studies reported both coefficient alphas and composite reliability and one study used all three fit measures recommended by Gerbing and Anderson (1992). Like any statistical tool, SEM's benefits are obtained only if it is properly applied. Missteps would lead to the results' invalidity and inhibit researchers' ability to develop knowledge.

In the next section, we follow the checklist provided by Shook et al. (2004) for using SEM except that this research doesn't involve respecification of the model. In fact, respecification is controversial although it is common in social sciences. Anderson and Gerbing (1988) argue that respecifications should be based on theory and content considerations in order to avoid exploiting sampling error to achieve satisfactory goodness of fit. Brannick (1995) argues that respecifications should not be done at all. In the current research, we chose to test the hypotheses based on theory, instead of searching for a model with the best goodness of fit.

4. Results and Discussion

4.1. Assessment of validity and reliability

Before testing the hypotheses, we assessed the validity and reliability of the measurements. First, following Bentler and Chou (1987), the estimated reflective loadings and their accompanying significance levels are examined using confirmatory factor analysis (CFA) to assess the factor structures of the items. The complete loadings for the indicators from the CFA analysis are reported in Table 3. In most cases, path coefficients from the latent constructs to their corresponding manifest indicators are above 0.6 and statistically significant at p <0.05. The factor loadings of Ba2, Ba4 and Da1 are relatively low but still significant[4] and statistically acceptable. The significant loadings of individual items on their underlying factor also established convergent validity of these constructs. Furthermore, the average variance extracted (AVE) is about 72%, suggesting that the convergent validity is acceptable. For each pair of measures, the AVE for each measure is greater than the squared structural link between the two measures, providing evidence of discriminant validity (Fornell and Larcker, 1981).

We also examined the reliability of the constructs. As reported in Table 3, Cronbach's alpha (α) for most of the constructs is above 0.7, although it is slightly lower for the constructs of local environment and local resources[5]. Although Coefficient alpha is the most common measure of reliability, it has several limitations. For example, the coefficient alpha wrongly assumes that all items contribute equally to reliability

[4] For a sample of 250 observations, factor loading of 0.35 or above are significant (Hair et al., 2006, p128).

[5] This is not surprising as we use two indicators only for each of these two constructs. Given its definition, Cronbach's alpha is affected by the number of indicators used. Theoretically, alpha can take values between negative infinity and 1 (although only positive values make sense). Practically, as a rule of thumb, a reliability of 0.70 or higher is usually required (Nunnally, 1978, p245).

(Bollen, 1989). We then proceeded to examine the composite reliability, which draws on the standardized loadings and measurement error for each item and is a better choice for examining reliability (Shook et al., 2004)[6]. As reported in Table 3, the constructs exhibit high composite reliability (ρ_c) with the exception of local environment and local resources, which is below 0.70.

Insert Table 3 about here

4.2. Results and discussion

The model is estimated using LISREL 8.54 (Joreskog and Sorbom, 1996) to estimate the parameters. Maximum likelihood is used as the estimation technique and the input matrix is the covariance matrix. The starting value is chosen by the programme automatically. Table 4 reports the indices of goodness of fit and parameter estimates for both the initial year and the current year.

Insert Table 4 about here

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[6] Definition of composite reliability is: (L1+...Lk)^2/[(L1+...Lk)^2+(Var(E1)+...+Var(Ek))] , where Li= the standardized factor loadings for the factor, Var(Ei)=the error variance associated with the individual indicator variables. A popular rule of thumb is that 0.70 is an acceptable threshold for composite reliability, with each indicator's reliability above 0.50 (Fornell and Larcker, 1981).

Model fit is another significant issue when using SEM. Before assessing individual parameters, the overall fit of the observed data to a priori model must be examined (Joreskog et al., 1999)[7]. Fit indices ascertain if the covariance matrix derived using the hypothesized model is different from the covariance matrix derived from the sample. A chi-square test is the most common fit measure. As reported in Table 4, the chi-square of our model is not satisfactory. However, chi-square is only recommended with moderate samples, e.g., 100 to 200 (Tabachnick and Fidell, 1996). With large samples, a trivial difference between the two matrices becomes significant. Several "comparative fit" indices have emerged but they may or may not be appropriate for a specific data set (Brannick, 1995). Because of these limitations, the use of multiple indices is important. Gerbing and Anderson (1992) suggest that among the most stable and robust fit indices are the DELTA2 index, the relative noncentrality index (RNI), and the comparative fit index (CFI), all reported in Table 4. These three indices of the model are all satisfactory[8].

We then proceed to look at the estimated parameters of the model. We first examine the results for the initial year. As indicated in Table 4, the host country investment environment has the expected positive and significant (γ_{11}=0.11, t =2.22) impact on external relatedness of a multinational subsidiary. H1a is then supported. Locally available resources also have the expected positive impact on external relatedness of a multinational subsidiary, but the coefficient is only marginally significant (γ_{21}=0.09, t= 1.78). Therefore, H1b is marginally supported. The results on H1 show that both the sound investment environment and location-specific advantages in terms of local

[7] LISREL can report the results of model fit and estimated parameters in one run.
[8] However, we acknowledge the possible existence of equivalent models due to the limitation of SEM (Brecker, 1990; MacCallum et al., 1993).

knowledge and technology indeed encourage multinational subsidiaries to develop their external strategic relations in order to learn from local partners. However, the marginally significant coefficient on the locally available resources may suggest that the identification and development of strategic relatedness takes time (Benito et al., 2003).

Turning to H2a, it is interesting to find that internal embeddedness has the unexpected negative and highly significant (β_{32} =-0.53, t = 7.53) impact on specialized resources. H2a is disproved. The negative coefficient on internal embeddedness does not mean that it is always bad to learn from the rest of the MNE. Rather, it is to some extent due to our definitions of internal strategic relatedness and specialized resources. In this study, internal enbeddedness is measured by production, general management, R&D and marketing help from the parent and sister subsidiaries within the MNE. Although it is useful for knowledge enhancement, such help may not be enough for a subsidiary to develop its own competences better than the rest of the MNE. Furthermore, it may be possible that the more a subsidiary learns and adopts knowledge from the parent and sister subsidiaries, the less incentive this subsidiary may have to conduct its own innovations and develop its own unique capabilities. Therefore, the relationship between internal strategic embeddedness in terms of learning from the rest of the MNE and the development of specialized resources can be negative.

The coefficient on external relatedness has the expected positive sign but not highly significant (β_{31} =0.15, t = 1.51). Therefore, H2b is not significantly supported. Similar to the explanation for the impact of locally available resources on external strategic relatedness, the reason for the insignificant impact of external strategic relatedness on

specialized resources may be that in the initial year the external strategic relatedness established by multinational subsidiaries is still at its infant stage and these subsidiaries could not significantly benefit from such business relations.

Given the very low t (β_{43} =0.04, t=0.08) value, H3 is not supported. While a subsidiary that has generated specialized resources tends to have greater autonomy as H3 predicts, Young and Tavares (2004) argue that distinctive capabilities may lead to perceptions of empire building (Birkinshaw & Ridderstrale, 1999) or subversive behaviour (Tavares, 2001), or organizational isolation (Yamin, 2000). Hence, the parent firm may exercise its control in order to bring this subsidiary into coordinated and interdependent networks to maximise its usefulness to the HQ. Thus, the relationship between the development of specialized resources by a subsidiary may not significantly related to the level of autonomy. Autonomy may be *assumed* through subsidiary behaviour (Birkinshaw, 1997, 2000) but also *assigned* by the HQ.

H4a is strongly supported as the t value (β_{24} =-0.66, t=-4.74) indicates a highly negative impact of subsidiary autonomy on its internal strategic relatedness. Similarly, H4b is significantly supported (β_{14} =0.27, t = 3.79), confirming the positive impact of subsidiary autonomy on its external strategic relatedness. The results on H4 suggest that autonomy tends to encourage a typical multinational subsidiary to learn more from local partners but less from the rest of the MNE.

The above results are obtained when the data for the initial year are analyzed. As it takes time for a multinational subsidiary to identify locally available resources and develop its external strategic relatedness, the location-specific impacts may not be

present when a subsidiary is recently set up. To see whether the interactive relationships between subsidiary development and autonomy have changed, we have tested the same model using the data from the current (2005) year. The results are presented in the final column of Table 4.

As can be seen from Table 4, the overall results for the current year are qualitatively very similar to those for the initial year. The sign on each coefficient in the former is exactly the same as the counterpart in the latter. However, one important difference between the two results is that the impacts of the two location-specific variables of locally available resources and external strategic relatedness are now highly significant. This difference implies that so long as multinational subsidiaries have sufficient time to identify locally available resources and develop their strategic relations with local partners, they can enhance their specialized resources.

To summarizes the estimation results, both the host country investment environment (γ_{11}=0.20, t=5.07) and locally available resources (γ_{21}=0.21, t=4.52) have a significant positive impact on a subsidiary's external strategic relatedness. While external strategic relatedness has a significantl positive effect on specialized resources (β_{31}=0.30, t =3.10), the opposite is true of internal strategic relatedness (β_{32}=-0.23, t =-3.58). Specialized resources do not influence subsidiary autonomy (β_{43}=-0.00, t = -0.01), but autonomy has a significant negative impact (β_{24}=-0.24, t =-2.93) on a subsidiary's internal strategic relatedness and a significant positive impact (β_{14}=0.25, t =5.30) on the subsidiary's external strategic relatedness.

The central message from the findings of this study is as follows. A sound investment environment and locally available resources such as local knowledge and indigenous technology induce a multinational subsidiary to develop external strategic relations with and learn unique knowledge in production, general management, R&D and marketing from local partners. This helps the subsidiary develop its own specialized resources relative to the rest of the MNE. On the other hand, while internal strategic relatedness facilitates the subsidiary to learn from the rest of the MNE, it may discourage the subsidiary to conduct its own innovation to develop specialized resources. The possession of specialized resources does not confer subsidiary autonomy. On the other hand, autonomy itself encourages a subsidiary to learn from local partners (via external strategic linkages) but discourages it to learn from the rest of the MNE (via internal strategic linkages) for the purpose of developing its own specialized resources.

4.3. Sensitivity test

Further to the estimation of the main model, we tested the hypotheses by adding control variables to the model. Table 5 reports the estimated results. We first add the variable of *age* to the model. We then add another variable of *firm size*, which is measure by the logarithm of total employees. As indicated in the column named "Model 1", the age variable has a negative sign but is statistically insignificant (t = -1.05). However, when both the age and firm size variables enter the model, their coefficients become marginally significant (see the column named "Model 2"). The age variable still has the negative sign, but the size variable bears a positive sign. Age normally implies experience both in the host country market and in terms of the

subsidiary's negotiating position within the MNE group (Young and Tavares, 2004), and is expected to have a positive effect on autonomy. Our result does not support this argument. Our tentative interpretation is that age allows a subsidiary to enhance strategic links with local partners in the host market and hence increase its specialized resources. This in turn attracts the headquarters' attention and control, and therefore the subsidiary's autonomy decreases. On the other hand, an increase in firm size in terms of employment does not seem to be a course of concern by the headquarters.

Our particular interest is in the interactive relationships between strategic embeddedness, specialized resources and autonomy as reflected in the six hypotheses. After adding the moderating effects of age and size, we have obtained qualitatively similar results to those from the main model with respect to these hypotheses. This indicates that the addition of the possible moderating variables has little impact on our main results.

Insert Table 5 about here

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5. Conclusions

One very important concept in multinational enterprise management is that autonomy can be both a cause and an effect of subsidiary development. However, so far little empirical research has been conducted on this topic. To fill in this gap, the current paper has investigated the interactive relationships between strategic relatedness,

specialized resources and subsidiary autonomy by testing a structural equation model on a distinctive data set of 243 multinational subsidiaries from an emerging economy.

The comparison of the results from the initial and current years indicates that it takes time for external strategic relatedness to be established and for its positive impact on a subsidiary's specialized resource development to be felt. The overall results show that the general investment environment and local knowledge and locally available technology in a host country significantly induce a multinational subsidiary to establish external strategic relatedness with and learn from local partners. This has a significantly positive impact on a subsidiary's development of specialized resources relative to the rest of the MNE. Internal strategic relatedness helps a subsidiary obtain and adopt knowledge from the rest of the MNE, but discourages the development of its own unique resources. Autonomy encourages a subsidiary to establish external strategic relations with and learn from local partners, but discourages it to enhance internal strategic relatedness with and learn from the rest of the MNE. The current study should contribute to our understanding of the development behavior of multinational subsidiaries in an emerging economy.

There are several important managerial and policy implications of this study. Firstly, the overall pattern of the interactive relationships between the host country conditions, strategic relatedness, specialized resources and autonomy tends to suggest that the development of multinational subsidiaries in China is sustainable. Past research on subsidiary autonomy and development focuses on developed countries which are world leaders in technology. Firms that locate close to technology leaders can benefit from reverse knowledge spillovers (Fosfuri and Motta, 1999; Driffield and Love,

2003). This study shows that multinational subsidiaries can benefit from their links with local partners even in an emerging economy as they can learn local knowledge and locally available technology which are important for their operations and development in this host country. Policymakers from home countries can then support outward FDI, and multinational enterprises can increase their investment into emerging economies to enhance the development of multinational subsidiaries.

Secondly, to attract more inward FDI, the host government needs to not only enhance its country's general business environment, but also encourage the improvement of locally available resources, including technological knowledge and skills. Thirdly, a multinational enterprise needs to be careful about subsidiary autonomy. It may wish to allow more autonomy to encourage its subsidiaries to learn from local partners and develop their own capabilities. At the same time, it needs to strengthen internal coordination and collaboration to engage subsidiaries to learn from and help each other in order to maximize their usefulness for the whole MNE.

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Figure 1: Interactive Relationships between Specialized Resources, Strategic Relatedness and Subsidiary Autonomy

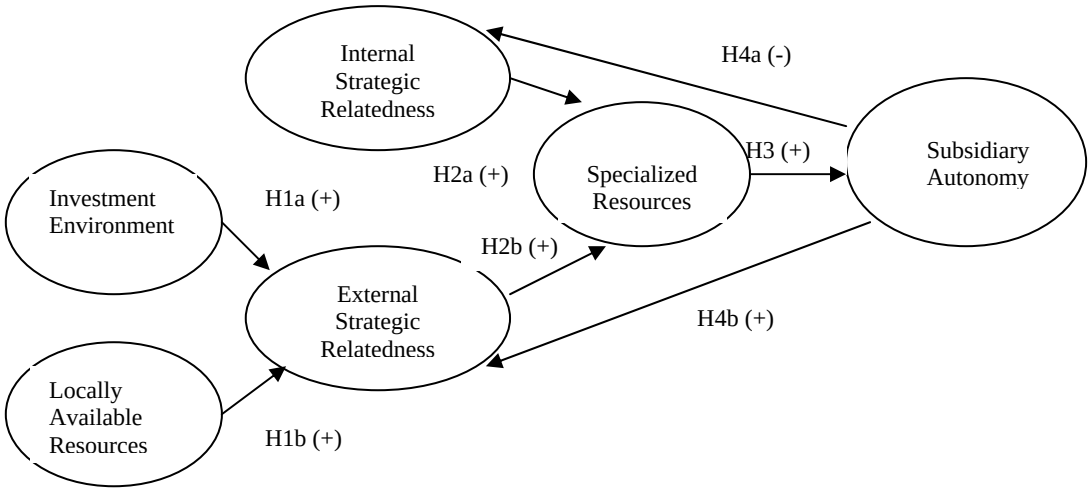

Table 1: An overview of the sample

Year of Establishment	Number of firms
2004	25
2003	26
2002	17
2001	21
2000	9
1999	15
1998	8
1986-1997	122
Location	243
Beijing	67
Nanjing	33
Chongqing	143
Country of Origin	
European-American	73
Asian	77
Ethnic Chinese	80
Others	13
Total	243

Table 2: Selected sample corporate statistics

	Mean	S.D.
Size		
Annual turnover	27308.16	97015.82
Total assets	18702.91	59134.17
Total employment	512.64	836.44
Performance		
Return on assets (ROA)	0.17	0.22

Table 3: Constructs and indicators

Constructs and indicators	Initial year Factor loading (t-value)	α	ρ_c	Current year Factor loading (t-value)	α	ρ_c
Specialized resources		0.86	0.81		0.85	0.82
A1：Enterprise Production	1.00			1.00		
A2：General Management	1.34 (17.06)			1.08 (15.78)		
A3：Research and Development	0.96 (15.48)			1.36 (15.92)		
A4：Marketing	1.19 (15.17)			0.92 (12.97)		
Internal relatedness		0.76	0.74		0.79	0.76
Ba1：Production help from parent and sister subsidiaries	1.00			1.00		
Ba2: Management help from parent and sister subsidiaries	0.44 (10.26)			0.51 (11.58)		
Ba3: R&D help from parent and sister subsidiaries	1.36 (16.24)			1.05 (19.32)		
Ba4: Marketing help from parent and sister subsidiaries	0.45 (8.96)			0.51 (8.91)		
External relatedness		0.70	0.70		0.86	0.84
Bb1: Production help from local partners in China	1.00			1.00		
Bb2: Management help from local partners in China	0.94 (18.61)			1.25 (17.01)		
Bb3: R&D help from local partners in China	0.91 (20.34)			0.89 (13.99)		
Bb4: Marketing help from local partners in China	1.11 (16.09)			1.16 (14.82)		
Autonomy		0.85	0.80		0.80	0.77
C1：Enterprise Production	1.00			1.00		
C2: General Management	0.69 (20.35)			0.59 (19.03)		
C3：Research & Development	1.09 (12.56)			0.69 (12.07)		
C4：Marketing	0.89 (17.77)			0.96 (14.81)		
Local environment		0.61	0.59		0.70	0.69
Da1: How do you evaluate the local investment environment	0.30 (4.13)			0.47 (10.99)		
Da2: How is the company's relationship with local government	0.99 (5.03)			0.78 (13.34)		
Local resources		0.61	0.58		0.64	0.61
Db1: is local knowledge essential	0.58 (6.04)			0.47 (6.77)		
Db2: is local available technology essential	0.68 (6.80)			0.46 (5.54)		

Table 4: Structural parameter estimates and goodness-of-fit indices, N=243

Hypotheses	Paths	Parameters	Initial year		Current year	
			Estimate (*t*-value)		Estimate (*t*-value)	
H1a	Local environment – external relatedness	γ_{11}	0.11 (2.22)	Supportive	0.20 (5.07)	Supportive
H1b	Local resources – external relatedness	γ_{21}	0.09 (1.78)	Marginally supportive	0.21 (4.52)	Supportive
H2a	Internal relatedness – strategic resources	β_{32}	-0.53 (-7.53)	Supportive	-0.23 (-3.58)	Supportive
H2b	External relatedness – strategic resources	β_{31}	0.15 (1.51)	Non-supportive	0.30 (3.10)	Supportive
H3	Strategic resources – autonomy	β_{43}	0.04 (0.82)	Non-supportive	-0.00 (-0.01)	Non-supportive
H4a	Autonomy – internal resources	β_{24}	-0.66 (-4.74)	Supportive	-0.24 (-2.93)	Supportive
H4b	Autonomy – external resources	β_{14}	0.27 (3.79)	Supportive	0.25 (5.30)	Supportive

For initial year, χ^2 =1111.56, CFI=0.79, DELTA2=0.85, RNI=0.83.

For current year, χ^2 =843.21, CFI=0.86, DELTA2=0.89, RNI=0.88.

Degree of freedom is 162.

Table 5: Sensitivity test for the current year, N=243

Hypotheses	Paths	Parameters	Model 1 Estimate (*t*-value)	Model 2 Estimate (*t*-value)
H1a	Local environment – external relatedness	γ_{11}	0.21 (5.61)	0.17 (4.49)
H1b	Local resources – external relatedness	γ_{21}	0.21 (4.71)	0.23 (4.81)
H2a	Internal relatedness – strategic resources	β_{32}	-0.23 (-3.66)	-0.23 (-3.64)
H2b	External relatedness – strategic resources	β_{31}	0.31 (3.28)	0.31 (3.22)
H3	Strategic resources – autonomy	β_{43}	-0.03 (-0.44)	-0.01 (-0.24)
H4a	Autonomy – internal resources	β_{24}	-0.25 (-3.03)	-0.26 (-3.16)
H4b	Autonomy – external resources	β_{14}	0.24 (4.97)	0.22 (3.91)
Moderators	Age – Autonomy		-0.04 (-1.05)	-0.17 (-2.02)
	Size – Autonomy			0.26 (2.22)

For model 1, χ^2 =1429.31, CFI=0.70, DELTA2=0.74, RNI=0.70.

For model 2, χ^2 =1505.60, CFI=0.70, DELTA2=0.72, RNI=0.69.

APPENDIX 1

Wording of questionnaire items

Local environment *(Source:* Benito et al. 2003)

How do you evaluate the local investment environment?

How important is your relationship with local government?

Local resources *(Source:* Benito et al. 2003)

Is local knowledge essential for your development?

Is locally available technology essential for your development?

Internal relatedness *(Source:* Andersson et al. 2002)

Indicate the degree of which you obtain production help from parent and sister subsidiaries.

Indicate the degree of which you obtain mmanagement help from parent and sister subsidiaries.

Indicate the degree of which you obtain R&D help from parent and sister subsidiaries.

Indicate the degree of which you obtain marketing help from parent and sister. Subsidiaries.

External relatedness *(Source:* Andersson et al. 2002)

Indicate the degree of which you obtain production help from local partners in China.

Indicate the degree of which you obtain management help from local partners in China.

Indicate the degree of which you obtain R&D help from local partners in China.

Indicate the degree of which you obtain Marketing help from local partners in China.

Specialized resources *(Source:* Birkinshaw et al. 1998)

Indicate the degree of your capabilities and resources compared to the rest of the MNE in the following areas:

Enterprise Production

General Management

Research and Development

Marketing

Autonomy *(Source:* Taggart, 1988)

Among the four categories of decision making: (1) by parent without consulting subsidiary; (2) by parent after consulting subsidiary by subsidiary; (3) by subsidiary after consulting parent; (4) by subsidiary without consulting parent, indicate the category of your decision making in the following areas:

Enterprise Production

General Management

Research & Development

Marketing