

**Entrepreneurship in Multinational Subsidiaries:  
The Effects of Corporate and Local Environmental Contexts**

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### **Abstract**

Mounting evidence suggests that the entrepreneurial activities of subsidiaries play a key role in determining the success of their parent multinational corporations (MNCs). However, little research has examined the factors that determine subsidiary entrepreneurship. This study presents a model of entrepreneurship, focusing on the corporate and local environmental contexts of subsidiaries. We hypothesize that the corporate context comprising global subsidiary mandates and control systems is an important determinant of subsidiary entrepreneurship. We also propose that the local environmental context comprising dynamism, hostility, and complexity influences a subsidiary's future entrepreneurship. We test the hypotheses using data collected at two points in time from 227 US-based foreign manufacturing subsidiaries of MNCs headquartered in Australia, France, Germany, Japan, Korea, Netherlands, and the UK. The analyses suggest that both corporate and local environmental contexts are positively associated with subsidiary entrepreneurship.

In today's fast changing environments, multinational corporations (MNCs) need to be innovative in order to sustain their market positions and competitive advantages (Bartlett & Ghoshal; 1998; Chiesa, 1999; Dunning, 1994). MNCs face considerable pressure to quickly and effectively respond to local market needs, while achieving global efficiency (Prahalad, 1999). This has led some MNCs to recognize the need to leverage innovation that occurs within their subsidiaries to meet global needs. Consequently, some MNCs have expanded the definition of their subsidiaries' missions while giving them greater freedom to pursue their goals. Modern subsidiaries differ in the scope of their operations, goals, strategic postures, and organizational cultures. These differences can increase subsidiaries' innovativeness, willingness to take risks, and ability to engage in entrepreneurial activities.

Some subsidiaries have seized the opportunity created by ongoing changes in the global marketplace by pursuing innovative ventures and engaging in radical innovation (Dunning, 1994; Poynter & White, 1989; Roth & Morrison, 1992). These subsidiaries have also become more proactive in their operations, reaching the market with innovations well ahead of their rivals (Birkinshaw, 1998, 1999; Birkinshaw, Hood & Jonsson, 1998). For example, Philips' subsidiary in Canada created the company's first color TV; Philips of Australia created the first stereo TV; and Philips of the UK created the first TV with teletext capabilities. Philips' headquarters encouraged innovation in their subsidiaries and later leveraged them for the global network (Lightfoot, 1992). Yet, other subsidiaries have been less able to engage in entrepreneurial activities or have been constrained in their efforts by corporate headquarters' (HQs) controls. For instance, Beckton Dickinson's Japanese subsidiary required approval to develop a specific type of medical equipment to satisfy local market needs but their HQ was unwilling to support such local innovative activities. This has resulted in a loss of market share and profitability in the Japanese market (Scharf, 1993).

Despite these potential differences in entrepreneurial intensity among MNC subsidiaries, little research has examined the sources of these differences from the international management perspective.

Most entrepreneurship research has focused on explaining variations in entrepreneurship at the country (Shane, 1993) and firm levels of analysis (e.g., Barringer & Bluedorn, 1999; Stopford & Baden-Fuller, 1994). In the process, entrepreneurship research has failed to identify factors that can explain differences in subsidiaries' entrepreneurship (Birkinshaw, 1999; Birkinshaw & Hood, 1997, 1998). Conversely, research in international management recognizes the implications of HQ's strategic imperatives and the responsiveness demands arising in the local subsidiary environment for subsidiary structures and processes (e.g., Birkinshaw, 1999; Doz & Prahalad, 1981, 1986; Prahalad & Doz, 1987). While there is some case-based evidence on the influence of corporate and local market contexts for subsidiary entrepreneurship, limited empirical research has explicitly considered the implications of the corporate context and the local market environment for a subsidiary's entrepreneurship. This study integrates the entrepreneurship and international management research by responding to calls for research on this topic (Birkinshaw, 1999; Dana, Etemad, & Wright, 1999), and examines the effects of both the corporate and local environmental contexts on a subsidiary's entrepreneurship.

Corporate context refers to the strategic directives of the HQ and the control mechanisms used by the headquarters to evaluate managerial performance. Strategic directives can be in the form of a global mandate that defines the sphere and nature of a subsidiary's activities (Roth et al., 1991; Roth & Morrison, 1992). Birkinshaw (1998) suggests that a subsidiary's strategic mandate can intensify entrepreneurship by increasing the subsidiary's access to multiple resources and knowledge bases within the MNC's network. In addition, control mechanisms as well as the autonomy provided to the subsidiary can increase the amount of discretion the subsidiary's managers have in initiating and supporting various innovative projects (Roth & Morrison, 1992; Prahalad, 1999). Greater autonomy empowers subsidiary managers, which can increase their willingness take risks and support entrepreneurship (Lumpkin & Dess, 1996; Zahra & Covin, 1995). Consequently, the corporate context is likely to influence entrepreneurship within subsidiaries.

Local environmental context refers to the market characteristics the subsidiary faces in its local domain. It refers to the environmental dynamism and complexity, political conditions, economic imperatives, legal entities, and socio-cultural influences that are essentially local in nature (Rosenzweig & Singh, 1991). Bartlett and Ghoshal (1993) note that changing local conditions place unique pressures on subsidiary managers to be responsive to the opportunities that exist in their immediate environment. For example, Unilever faces pressures to ensure product standardization because of economic and competitive forces in the laundry detergent segment in many of its advanced markets. However, the large Indian market with highly competitive low cost producers makes local product development essential in creating innovative products that can be sold in a vastly different laundry environment. Also, Porter (1986, 1992) suggests that subsidiaries facing sophisticated demand conditions and competitive national environments have to engage in more entrepreneurial activities such as initiating strategic renewal, developing new products or processes, or spawning new ventures in order to compete in the dynamic local markets. Consequently, the local environmental context can spur entrepreneurship within subsidiaries.

To address the issues raised above, the remainder of this article is organized as follows. The next section of the article develops the study's theoretical foundation and hypotheses. An empirical study that tests the hypotheses is then presented. Once the sample, measures and analytical tests are described, the results are summarized. The final section of the article discusses the study's findings and their implications for effective managerial practice and future research.

## **THEORY AND HYPOTHESES**

Entrepreneurship involves innovation, risk taking and proactiveness of subsidiary managers (Miller, 1983; Covin & Slevin, 1991a,b; Lumpkin & Dess, 1996; Zahra & Covin, 1995). Innovation refers to the creation, development and introduction of new products, processes, systems and organizational forms (Guth & Ginsberg, 1990; Schumpeter, 1950). Risk taking indicates the willingness to pursue goals and undertake action even when the results are uncertain (Miller, 1983; Morris, 1998), and may require

*calculated* risk taking (Stevenson & Jarrillo, 1990; Baden-Fuller & Stopford, 1994). Proactiveness denotes a subsidiary's commitment to initiate changes in its industry, rather than respond to the competition (Miller, 1983; Lumpkin & Dess, 1996). A proactive subsidiary is aggressive in its strategic moves (Knight, 1997) and is among the first to initiate strategic changes to pursue emerging opportunities (Covin & Covin, 1990).

Several authors have recognized the importance of subsidiaries' entrepreneurship for the overall success of the MNC (Bartlett & Ghoshal, 1986; Birkinshaw, 1998). For example, Bartlett and Ghoshal (1990) highlight the importance of "dispersed entrepreneurship" throughout Philips' international operations as a key determinant of that company's global success. Kogut (1990) also notes the importance of "local entrepreneurship" within an MNC, for it "provides not only motivational incentives, but also, the possibility that innovations in response to local market demands may be internationally useful..." (p.60). Similarly, a study by Papanastassiou and Pearce (1997) of foreign subsidiaries in the UK reveals that these companies informally made major adaptations to their products and goods in order to meet local market needs. These autonomous strategic activities are an important part of the firm's entrepreneurship (Burgelman & Sayles, 1986; Pinchot, 1985), as they reveal a willingness to take calculated risks. Finally, in his discussion of the challenges facing today's MNCs, Prahalad (1999) notes that these firms rely on innovations developed at the HQ as well as their subsidiaries to build new skills. These observations highlight the importance of studying subsidiaries' entrepreneurship. Though some entrepreneurial initiatives occur autonomously (Pinchot, 1985), many of them are stimulated by the subsidiary's corporate and local environmental context. Figure 1 highlights the variables examined in the current study.

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## **Corporate Context**

Research suggests that a firm's corporate context can have important implications for its entrepreneurship (Kanter, 1988; Miller, 1983; Zahra 1991). The corporate context of a subsidiary is often influenced by its mandate and the controls the HQ uses in assessing subsidiary performance (Figure 1).

**Global Subsidiary Mandate.** A factor that can determine a subsidiary's sphere of operations is its strategic mandate (Morrison & Roth, 1993; Poynter & Rugman, 1982; Roth et al., 1991). This mandate defines the role and objectives of the subsidiary and the scope of its operations (Pearce, 1992). A subsidiary's mandate evolves over time, reflecting the MNC's goals, the subsidiary's resources and skills, and the interactions between the HQ and the subsidiary (Birkinshaw & Hood, 1997; Roth et al., 1991). A global mandate means that the subsidiary plays a dominant role in making decisions about the products to be made and the markets to be covered (Roth & Morrison, 1992). Though the influence of the HQ in these areas may decline, the subsidiary remains an integral part of the MNC's network while the HQ continues to provide the resources that the subsidiary needs (Bartlett & Ghoshal, 1986). The HQ also monitors and evaluates the subsidiary's operations and ensures their consistency within the MNC's overall objectives. Thus, even with a global mandate, the subsidiary does not have complete autonomy from its HQ but remains an integral part of the MNC's overall network (Roth & Morrison, 1992).

A global subsidiary mandate (GSM) is expected to intensify a subsidiary's entrepreneurship. First, a GSM usually means that the subsidiary has its primary value-chain activities located in multiple geographic sites around the globe (Morrison & Roth, 1993; Roth & Morrison, 1992). This dispersion can expose the subsidiary to multiple sources of local knowledge, which can increase innovation (Bartlett & Ghoshal, 1988; 1990; Chiesa, 1999). This is one reason some MNCs have established subsidiaries in the US to capitalize on the rich and dynamic technological knowledge that exists in different regions of this country (Florida, 1997). The dispersion of operations can also intensify knowledge inflows (Gupta & Govindarajan, 1991), which can stimulate radical innovations. Thus, the subsidiary can cultivate local

knowledge in its operations (Barkema, Bell & Pennings, 1996), which helps to reduce costs while allowing the subsidiary to innovate.

Second, subsidiaries reside within the context of different national innovation systems (Archibugi & Pianta, 1992) and are influenced heavily by their immediate context. A GSM requires the subsidiary to interact directly with other subsidiaries couched in different national systems of innovation (Porter, 1998). This interaction, in turn, allows subsidiaries with GSMs to learn from their counterparts, thereby increasing their innovation (Hitt, Hoskisson & Kim, 1997). This exposure encourages the subsidiary to adopt or utilize local practices in its operations (Kuemmerle, 1997), which can stimulate entrepreneurship.

Third, subsidiaries with GSMs usually develop important linkages to their customers and vendors (Morrison & Roth, 1993), which can increase their exposure to different systems of management and innovation. Closeness to foreign markets and customers also gives the firm important knowledge and other resources that enhance innovation (Turnbull, Oliver & Wilkinson, 1992). It also intensifies the subsidiary's quest for greater responsiveness to customer expectations, increasing the subsidiary's proactiveness and willingness to take risks (Morris, 1998). Interactions with customers can also improve the subsidiary's ability to identify promising innovative ideas, as experienced by Japanese companies in their international expansion (Kodama, 1992). Innovations are often developed in response to requests and ideas of suppliers and customers. Lead users can also help the subsidiary refine its innovations and make them more user friendly (von Hippel, 1989). These innovations can improve the subsidiary's ability to meet existing demand in current markets or venture into new ones. Venturing is an important component of entrepreneurship and is fundamental to wealth creation (Casson, 1997; Guth & Ginsberg, 1990; Zahra, 1993).

Finally, GSM can increase entrepreneurship because the subsidiary usually manufactures and markets its own products (D'Cruz, 1986). This expanded responsibility creates opportunities for "learning by doing" (Rosenberg, 1982), which can further stimulate and intensify innovation (Leonard-Barton, 1995).

As the subsidiary assumes a greater role in planning, designing and manufacturing its products and then marketing them, its ability to identify viable ideas for innovation increases. Completing these tasks also requires creativity and experimentation, a process that can intensify the search for innovative ways to achieve effective product design, introduction and marketing. These observations suggest the following hypothesis:

***Hypothesis 1:*** *A global subsidiary mandate is positively associated with a subsidiary's entrepreneurship.*

**Autonomy.** As noted previously, the role subsidiaries play in today's MNCs has undergone significant changes in recent years, from passive compliance with the HQs' directives to developing and implementing those strategic initiatives deemed important by local managers (Bartlett & Ghoshal, 1998; Birkinshaw et al., 1998; Hedlund & Rolander, 1990; Taggart, 1998). Subsidiary managers are close to their local markets and are frequently better-informed about market needs. This freedom to act independently from HQ has enabled subsidiary managers to pursue innovative activities they deem important for the successful execution of the MNC's mission. The autonomy that a subsidiary enjoys can motivate its managers by giving them a sense of empowerment that translates into a greater willingness to explore, support and pursue innovative and risky projects (Birkinshaw, 1999). Autonomy also gives managers some discretion in promoting entrepreneurship that can help sustain a strong local market presence (Papanastassiou & Pearce, 1997). Earlier empirical research also indicates that autonomy is positively associated with greater innovations in the MNCs' subsidiaries (Ghoshal, 1986).

The preceding discussion suggests that those subsidiaries that enjoy a higher level of autonomy are expected to report higher levels of entrepreneurship. Prahalad and Doz (1987) observe that "innovation and entrepreneurship tend to flourish when organizational arrangements allow for "freedom to act" (p. 130) Research also shows that decentralization, which yields greater autonomy for units and their managers, is associated with higher entrepreneurship (Miller, 1983; Zahra, 1991). Jennings and Seaman

(1990) also report that firms with higher levels of venturing activities maintain organic structures, as these structures usually exhibit a high degree of decentralization. Finally, Birkinshaw (1996) observes that subsidiaries that enjoy greater autonomy from their parents are able to “allocate resources to new business opportunities...without involving the parent company” (p. 479). This process can foster entrepreneurship (Pinchot, 1985; Stevenson & Jarrillo, 1990). These arguments suggest that:

***Hypothesis 2:*** *Subsidiary autonomy is positively associated with a subsidiary's entrepreneurship.*

**Strategic Controls.** MNCs have to balance the autonomy they grant their subsidiaries against the corporate need for integration and coordination (Cray, 1984; Doz & Prahalad, 1986). Despite its potential importance for promoting flexibility and entrepreneurship, autonomy has serious side effects, including the need for more coordination and potential duplication of activities. Thus, MNCs install control systems to monitor and evaluate the performance of their subsidiaries (Gupta & Govindarajan, 1991; Martinez & Jarillo, 1989; 1991). Control systems typically reflect MNCs' dominant values and cultures and, as a result, can influence the behavior of subsidiary managers (Bartlett & Ghoshal, 1998; Hedlund, 1986; Prahalad & Doz, 1981). Therefore, control systems can influence a subsidiary's future entrepreneurship.

MNC control systems can be classified as being either strategic or financial in nature. Strategic controls involve qualitative assessments of the subsidiary's performance based on its objectives and competitive environment (Hoskisson, Hitt & Hill, 1993). These controls have a long-term orientation (Hitt et al., 1996), which can promote managers' support of initiatives that enhance long-term value creation. Barringer and Bluedorn (1999) propose that strategic controls “are capable of rewarding creativity and the pursuit of opportunity through innovation” (p.426). When strategic controls prevail, managers are more inclined to support risky ventures whose outcomes are uncertain (Hitt, Hoskisson & Ireland, 1990; Hitt, Hoskisson Johnson & Moesel, 1996). Consistent with these observations, some prior research shows a positive relationship between a firm's use of strategic controls and its support of innovative activities (Hitt et

al. 1990; Hitt et al., 1996; Hoskisson & Hitt, 1988; Hoskisson et al., 1991). Given that many entrepreneurial activities fail (Block & MacMillan, 1993; Morris, 1998), the reputation and careers of subsidiary managers who champion these activities are likely to suffer. However, where strategic controls exist, subsidiary managers are more likely to support venturing activities (Hoskisson & Hitt, 1988). Consistent with this proposition, Barringer and Bluedorn (1999) have recently found a significant positive relationship between the use of strategic controls and a firm's entrepreneurship. These observations lead to the following hypothesis:

***Hypothesis 3:** The use of strategic controls is positively associated with a subsidiary's entrepreneurship.*

**Financial Controls.** These controls are usually based on quantifiable goals and objectives (McInnes, 1971). Financial controls usually focus on documenting and evaluating the progress the subsidiary makes in accomplishing pre-established goals (Hitt et al., 1990). These controls, therefore, resemble the output controls that Egelhoff (1984) identified in his research on American and European MNCs. Financial controls usually tie managers' compensation to the achievement of specific short-term performance goals (Hoskisson et al., 1991, 1993). Consequently, managers are less likely to take risks or support projects whose outcomes are uncertain. Subsidiary managers are likely to become risk averse and withhold political and financial support for entrepreneurial projects. In support of this proposition, some research suggests a negative relationship between the use of financial controls and support for long-term value generating activities such as research and development (e.g., Hitt et al., 1996; Rappaport, 1978). The same negative association is expected with subsidiary entrepreneurship. These observations suggest the following hypothesis:

***Hypothesis 4:** The use of financial controls is negatively associated with a subsidiary's entrepreneurship.*

## **Local Environmental Context**

Local environmental context can also have a significant influence on a subsidiary's strategic choices (Ghoshal & Nohria, 1989; Jarrillo & Martinez, 1990; Kotabe, 1990; Porter, 1986). Though several studies have examined the effect of host country and local market conditions on MNCs' decisions to establish subsidiaries (Delios & Beamish, 1999), researchers have not explored the specific effect of these variables on a subsidiary's entrepreneurship. Following this literature (e.g., Boyd, Dess & Rasheed, 1993; Covin & Slevin, 1991; Miller, 1983; Zahra & Covin, 1995), managers' perceptions of their local industry conditions are expected to significantly influence the level of subsidiary entrepreneurship. Researchers have observed that firms which compete in turbulent environments are more likely to be entrepreneurial than firms in stable environments (Barringer & Bluedorn, 1999; Miller, 1983). As depicted in Figure 1, environmental turbulence is characterized by perceived dynamism, hostility, and complexity of a subsidiary's local environment.

**Environmental Dynamism.** Dynamism refers to the changes that occur in a subsidiary's environment because of technological or market shifts. Technological shifts create new opportunities for companies to pursue profitability and growth (Tushman & Anderson, 1986). Subsidiaries competing in dynamic industries are likely to experience pressures to revise their technological assets and build new capabilities or risk failure. Dynamism also means that innovation is fast-paced, causing technological obsolescence among companies that fail to upgrade their products (Prahalad, 1999). In this dynamic environment, a subsidiary has to be aggressive in its innovation as well as be proactive in pursuing emerging market opportunities (Covin & Covin, 1990). This, in turn, requires a subsidiary to promote a risk taking orientation among its employees, which would intensify entrepreneurship (Kuratko et al., 1990). Dynamism also fosters the development of radically new products (Utterback, 1994), where the firm can develop a reputation for being on the forefront of technological change. A subsidiary can use this reputation to target new customer groups and achieve higher profits, or offset the liability of foreignness in

its local markets. Thus, as found in some prior research, where dynamism is viewed as high, the subsidiary is likely to become more entrepreneurial (Covin & Slevin 1989; Miller, 1983; Zahra, 1991, 1993).

Dynamism also results from changes in the mix or demographics of the market served by the subsidiary (Prahalad, 1999). It might result also from the aggressive market campaigns waged by a subsidiary's domestic or foreign rivals. A dynamic environment can prompt the subsidiary to innovate and take calculated risks (Morris, 1998), becoming more proactive in its operations. Proactiveness can enhance the subsidiary's responsiveness to the changing expectations of their customers. Dynamism also creates new opportunities that subsidiaries can pursue to achieve profitability and growth. Thus, as managers perceive higher levels of dynamism in their environment, the subsidiary's entrepreneurship will intensify. These observations suggest the following hypothesis:

***Hypothesis 5:*** *Dynamism of the local market is positively associated with a subsidiary's entrepreneurship.*

**Environmental Hostility.** Another source of turbulence is the perceived hostility of the subsidiary's local environment. Hostility results from unfavorable changes in the local market through the proliferation of rivals (Miller, 1993), shifts in the ways companies position themselves, adverse regulatory changes (Morris, 1998), or increased state protectionist policies of home country companies (Miller, 1993). When subsidiary managers view these changes as unfavorable, they are likely to explore ways to reduce the overall negative effect of these conditions on their operations (Morris, 1998; Zahra, 1993). Subsidiaries are likely to experiment with new systems of management and organization, hoping to foster a spirit of innovation and risk taking in their operations. This process can increase the subsidiary's entrepreneurship (Miller, 1983; Zahra, 1991).

Researchers have also noted that increased environmental hostility stems from globalization and resultant intensity of competition in an industry (Bartlett & Ghoshal, 1989; Pearce, 1992; Porter, 1986). Nohria and Garcia-Pont (1991) state that, "The globalization of an industry destroys its previous structural

and competitive equilibrium...[it] creates the simultaneous need for global-scale efficiencies, worldwide learning, and local responsiveness" (p.107). Addressing these challenges requires innovation and a willingness to take risks in order to capitalize on the knowledge that exists in the firm's diverse markets. Hostility resulting from globalization may also influence subsidiary entrepreneurship. Globalization opens the industry to companies with different strategies and skills (Pearce, 1992), which can stimulate innovation in a subsidiary.

Similarly, Dunning (1986) observes that the intensity of competition has been the major stimulus to the adoption of innovative technology developed in Japan among British companies. Studies by the MIT Commission on Industrial Productivity (Dertouzos, Kester, Solow, 1989) also conclude that the proliferation of foreign companies in several US industries has caused domestic firms to assume greater risks, encourage innovation and reward entrepreneurship. These companies have also become more attentive to rapid technology commercialization. Baden-Fuller and Stopford (1994) have observed a similar pattern among the European companies they studied; the influx of foreign rivals has increased domestic managers' perceptions of the hostility of their local environment which, in turn, has led these companies to encourage and reward entrepreneurship. These observations suggest the following hypothesis.

***Hypothesis 6:*** *Hostility of the subsidiary's local market is positively associated with a subsidiary's entrepreneurship.*

**Environmental Complexity.** A final source of turbulence is the perceived complexity of the subsidiary's business environment. This complexity might result from the perceived diversity of the needs of the different customer groups that the subsidiary serves (Miller, 1983; Miller & Friesen, 1982). It might also result from the perceived interconnectedness of the different external forces that influence the subsidiary's operations. Interconnectedness creates uncertainty about the firm's environment, making it difficult for managers to plan ahead. If the local environment is viewed as complex, then the subsidiary is expected to become more proactive in its operations and supportive of entrepreneurial risk taking (Morris,

1998). Prahalad (1999) notes that the complexity of today's global business environment has been a major reason for the growing emphasis on entrepreneurship among MNCs. Other researchers have also highlighted the importance of environmental complexity as a catalyst for innovation and risk taking (Bartlett & Ghoshal, 1998; Ostry, 1998; Porter, 1998). Some prior research has also concluded that increased environmental complexity is associated with higher levels of entrepreneurship (Miller, 1983; Zahra, 1991). These observations suggest the following hypothesis:

***Hypothesis 7:** Complexity of the local market is positively associated with a subsidiary's entrepreneurship.*

## METHOD

### Sample

To test the study's hypotheses, we collected data by administering mail surveys in 1995 and 1999 to manufacturing subsidiaries of foreign companies operating in the US. As noted by previous researchers, secondary data on subsidiary activities are scarce and are collected at an aggregate level (Nohria & Rosenzweig, 1994). To develop a list of manufacturing subsidiaries we used multiple sources that included: *The Directory of Foreign Manufacturers in the United States* (Arpan & Ricks, 1993), MacMillan & Co. Corporate Affiliations (1995, 1999), and several state directories. We focused on manufacturing firms, ensuring the representation of diverse industries that represented both low and high technology sectors. Finally, we excluded those subsidiaries that only performed sales, distribution and marketing. We included companies that have been in existence for at least three years to ensure that they have survived the initial liability of newness and foreignness. This process led us to identify 2743 subsidiaries.

We pre-tested the questionnaire using 100 companies, representing ten industries in 1995. Of these questionnaires, 31 were returned and the information was used to improve the wording and the layout of the survey. Once this process was completed, we asked five experienced subsidiary managers to review and critique the questionnaire. This process led to further refinements in the survey instrument.

The final data collection was done in two stages. In the first, the refined survey (measuring the corporate, local environment, and control variables) was mailed twice to the subsidiary's most senior managers in 1995 and 1996. Of the 2743 mailed questionnaires, 86 were not deliverable. We received 581 completed replies, for a response rate of 22 percent. This response rate was consistent with past studies (e.g., Nohria & Rosenzweig, 1994). To establish inter-rater reliability, we sent a copy of the survey to a second manager in each responding subsidiary (n= 581). Where possible we targeted the second highest executive. Thus, we received two completed surveys from 183 subsidiaries. We used these responses to test for inter-rater reliability, as reported later in the results section.

In the second stage, we sent a one-page version of the survey in 1999 measuring subsidiary entrepreneurship to the highest-ranking executive of the 581 subsidiaries that participated in the 1995-96 study. Twenty-three subsidiaries have ceased to exist, and our survey was not delivered to 29 additional managers. Of the remaining 529 companies, 227 responded to the single page follow-up survey. For our final sample of 227 subsidiaries, we sent a copy of the one-page questionnaire to a second senior executive. This resulted in 101 completed surveys that were used to establish inter-rater reliability for the study's dependent variables, as reported later in the paper.

Responding companies competed in 17 industries and averaged 23.19 (sd = 12.06) years. We conducted several tests to establish the representation of the sample to its population. Using 1995 and 1999 data, we ran a  $X^2$  test of the association between those responding and not responding to the survey and by industry type. The results were not significant. We used the t-test to determine if responding and non-responding firms were different in their size (measured by the number of employees) and age. The results were not significant for both the 1995 and 1999 surveys. Finally, we compared responding and non-responding companies based on their financial performance using secondary data for sales growth and return on assets. The t-test results were not statistically significant using the 1995 and 1999 data.

## Measures

We measured the dependent and independent variables using multi-item scales. The measures, along with their response format, are reproduced in the Appendix.

**Subsidiary Entrepreneurship (SUBENT).** Entrepreneurship was measured using Miller and Friesen's (1982) index, which had nine items ( $\alpha=.81$  and  $.82$  in the 1995 and 1999 surveys, respectively) and followed a five-point response format, as seen in the Appendix. Prior studies support the validity of this index which has been used to measure entrepreneurship in US (e.g., Barringer & Bluedorn, 1999; Covin & Slevin, 1991 a,b; Naman & Slevin, 1993; Zahra, 1991; Zahra & Covin, 1995), Canadian (Miller, 1983), Brazilian, South African (Morris et al., 1994), and Norwegian (Knight, 1997) firms. The SUBENT measure gauged the three dimensions identified by Miller (1983): innovation, risk taking and proactiveness.

As SUBENT was measured using responses to the 1999 short survey, we validated this measure by collecting data about the number of new products announced by some of the subsidiaries that participated in the survey in the intervening time period. These data were collected from *Lexis.Nexis* and trade publications for a period of three years, the period covered by SUBENT. When the number of new product announcements and SUBENT were correlated, the coefficient was positive and significant ( $r=.57$ ,  $n=71$ ,  $p<.001$ ). Given that SUBENT measures more than product innovations, this correlation was encouraging.

**Global subsidiary mandate (GSM).** The four-item index developed and validated by Roth and Morrison (1992) was used to measure GSM. A 5-point scale was used and the GSM index had an  $\alpha$  of  $.77$  in the current study, compared to an  $\alpha$  of  $.82$  in the Roth and Morrison study.

**Autonomy.** A six-item index was used to gauge a subsidiary's autonomy, as done in prior studies (e.g., Ghoshal & Bartlett, 1988). The autonomy index consisted of items that had a 5-point response format and an  $\alpha$  of  $.73$ .

**Strategic and Financial Controls.** Emphasis on strategic controls was measured using the three-item index ( $\alpha = .78$ ) developed and validated by Johnson et al. (1993) who reported a Cronbach's  $\alpha$  of .72. Barringer and Bluedorn (1999) reported an  $\alpha$  of .64 using the same measures. A three-item index was used to gauge financial controls ( $\alpha = .81$ ) and were taken from Hitt et al. (1996). Barringer and Bluedorn (1999) reported an  $\alpha$  of .77 using the same measures. All items for the strategic and financial control indexes has a 5-point response format.

**Local environmental context.** Three indices measured the perceived dynamism, hostility and complexity of the local environment. All three measures were developed and validated by Miller and Friesen (1982). Dynamism was measured using a five item index ( $\alpha = .72$ ). We employed a 7-item scale ( $\alpha = .63$ ) to measure hostility. Finally, a four-item index ( $\alpha = .68$ ) measured complexity. Prior researchers have used these measures (e.g., Barringer & Bluedorn, 1999; Covin & Slevin, 1989; Naman & Slevin, 1993; Zahra, 1991). All items for local environmental context followed a 5-point response format.

**Control Variables.** The analyses also included five control variables: the subsidiary's HQ country of origin, technological opportunities, size, age, and past performance.

**HQ-Country of Origin.** Research suggests that the country of origin can influence the roles and responsibilities of an MNC's subsidiaries (Bratlett & Goshal, 1990), an observation that has been supported by a study of foreign subsidiaries in the UK (Papanastassiou & Pearce, 1997). The country where the HQ is located can also affect the skills of the MNC, influencing the subsidiary's strategic choices (Casson, 1997; Shan & Hamilton, 1991). The culture of the parent organization can also influence the subsidiary's value system (Morris et al., 1994), which would impact SUBENT. Further, there are significant differences in the policies MNCs use based on the country of origin. For instance, European and Japanese MNCs follow different innovation and product development policies, which can affect their subsidiary's innovation and risk taking (Kotabe, 1990). Japanese MNCs also have longer time horizons in managing their

international operations (Baliga & Jaeger, 1984), which can promote entrepreneurship in the subsidiaries (Porter, 1992). These differences in time horizons, which reflect national culture differences, can also impact the use of strategic and financial controls and, as a result, affect SUBENT.

Country of origin can also affect the amount of centralization the MNCs use. Martinez and Jarrillo (1989) note that US MNCs are more centralized than their Japanese counterparts. Baliga and Negandhi (1981) also report that subsidiaries of US MNCs have less autonomy than those of European and Japanese MNCs. Also, the country of origin is important because some national cultures espouse collectivist values, which can result in a low tolerance for risk taking (Morris et al., 1994). Finally, Almeida (1996) has found differences between subsidiaries of different national origins in their use of local knowledge, which can affect SUBENT. Clearly, though the effect of the country of origin on subsidiary entrepreneurship is an empirical issue, several factors that indicate a positive effect while other factors would indicate a negative effect on SUBENT. In this study, eight dummy variables were used in the analyses to control for the country of origin.

**Technological Opportunities.** This variable indicated the extent to which a subsidiary's environment offered opportunities for innovation (e.g., Johnson et al., 1993; Kogut, 1991). When major opportunities were believed to exist in an industry, the subsidiary was expected to support entrepreneurship. In this study, technological opportunities were measured using the three-year average of industry R&D spending as a percentage of sales, as done in previous research (e.g., Hitt et al., 1996; Hitt et al., 1997; Johnson et al., 1993). Data were obtained from *COMPUSTAT* and *US Industrial Outlook*.

**Subsidiary Size.** There is no agreement on the potential effect of a subsidiary's size on SUBENT. On the one hand, size is expected to be related to the amount of autonomy the subsidiary has (Chang & Taylor, 1999), which would increase SUBENT. Larger organizational size is also positively related to greater resource flows (Egelhoff, 1988; Roth et al., 1991), which would increase SUBENT. Yet, as found Gates and Egelhoff (1986) found that increased size is positively associated with the use of financial

controls, which would reduce SUBENT (Barringer & Bluedorn, 1999). Gates and Egelhoff (1986) found that increased size is associated with formalization, which would reduce SUBENT (Miller, 1983). In this study, size was measured by the number of a subsidiary's full-time employees as done in past research (e.g., Egelhoff, 1984; Roth et al., 1991; Roth & Morrison, 1992). Log normal transformation was used to correct for the skewness observed in this measure.

**Subsidiary Age.** Some new subsidiaries are created to exploit technological advances or new innovations, which would increase SUBENT. Younger subsidiaries also have to work hard to adapt to their local conditions (Franko, 1974), which can increase SUBENT. As the subsidiary becomes more established, inertia may also dominate its decision making process, reducing SUBENT. Thus, a subsidiary's age is expected to be negatively associated with SUBENT. Age was measured by the number of years since the subsidiary was established or acquired, as done in prior research (Egelhoff, 1984).

**Subsidiary's Past Performance.** High past performance usually increases the availability of slack resources, which can enhance a subsidiary's potential support for entrepreneurship (Kanter, 1988). A positive relationship, therefore, is expected between past performance and SUBENT. Following past research (e.g., Roth & Morrison, 1990; Roth et al., 1991), a subsidiary's performance was measured using managers' responses to four survey items: net income, return on assets, sales growth, and revenue growth. A five-point scale was used (5=in the top 20% of the industry vs. 1=in the lowest 20% of the industry). These items were selected to reflect the various objectives different subsidiaries might pursue (Carpano, Chrisman & Roth, 1994). The four items were subjected to a principal component analysis, which yielded a single significant factor (eigenvalue= 2.93). Managers' responses to the four items were averaged, and the resulting mean was used in the analyses ( $\alpha = .72$ ). Prior studies have used self-reported measures of performance (Roth & Morrison, 1990; Roth et al., 1991). These studies recognize the dearth of information on financial performance and the reluctance of managers to provide these detailed data

(Roth et al., 1991). Fortunately, several studies have found the data reported by managers to be strongly correlated with performance data collected from secondary sources (Roth & Morrison, 1990; Roth et al., 1991; Venkataraman & Ramanujam, 1987), providing support for this study's use of managers' evaluations.

## ANALYSIS AND RESULTS

**Inter-Rater Reliability (IRR) Analysis.** As reported earlier, data were collected from two managers from 183 subsidiaries in stage one of this research in 1995-1996. In addition, data were collected from two managers from 101 subsidiaries in stage two in 1999. This provided an opportunity to correlate the scores of the two respondents and establish IRR for both the independent and the dependent variables in our model. Simple correlations for the survey constructs are presented in Table 1. All correlations were significant at  $p < .001$ . When averaged, IRR was  $r = .70$ ,  $p < .001$ . There is no precise yardstick by which to gauge IRR. However, it is instructive to reflect on the IRR scores for the dynamism, hostility and strategic controls. Boyd et al. (1993) have already noted the difficulties associated with assessing managers' perceptions of their firm's environment. The relatively low correlation found in this study may reflect managers' different perceptions of the boundaries of their subsidiary's competitive environment, the conditions of that environment, and the assessment of these conditions. Furthermore, different managers scan different parts of the environment, which may account for their different perceptions regarding dynamism and hostility. Similarly, the low IRR score relating to strategic controls ( $r = .56$ ) might have resulted from managers' different levels of exposure to these systems and their individual reactions to them. Subsidiary managers are not always subjected to the same levels of review and evaluation, which can lead to very different perceptions of the use of strategic controls. Descriptive data such as the mean, standard deviation, Cronbach's  $\alpha$ , and inter-rater reliability are presented in Table 1.

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Insert Table 1 here  
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The zero-order correlations for the study's variables are presented in Table 2. The simple correlations between SUBENT and the other variables are consistent with theoretical expectations, except that financial controls are not significant. GSM is associated with dynamism, hostility and complexity. GSM is also associated with autonomy ( $r=.31, p<.001$ ), but the moderate correlation between these two variables indicates that these are two distinct constructs, which is consistent with Roth and Morrison (1992). Autonomy is also associated with a subsidiary's size and past performance.

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Insert Table 2 about here  
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To examine the relative effects of the corporate and local market contexts on a subsidiary's entrepreneurship, we used hierarchical multiple regression analysis. Initially, we entered the control variables (subsidiary age, size, past performance, technological opportunities and eight dummy variables for the country of origin) in Step 1. In order to test for the effects of corporate context, in Step 2 we introduced measures of GSM, autonomy, strategic and financial controls (Hypotheses 1 through 4). Next, to test for effects of the local market context of the subsidiaries, in Step 3 we entered measures of environmental dynamism, hostility, and complexity (Hypotheses 5 through 7). To determine the unique amount of variance accounted for by each block of variables, we examined the increase in the adjusted  $R^2$  at each step. The results of multiple regression analysis appear in Table 3. The overall regression equation model was significant ( $F=8.44, p<.001$ ), with an adjusted  $R^2$  of .29. The results are summarized below.

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Insert Table 3 here  
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**Control Variables.** The results presented in Table 3 show that a subsidiary's age and size have negative coefficients but are not statistically significant. Past performance has a positive coefficient but is

not statistically significant ( $\beta=.03$ ). Technological opportunities have a positive and marginally significant coefficient ( $\beta=.15$ ,  $p<.10$ ) with SUBENT. Table 3 also shows that the country of origin is associated with SUBENT. The dummy variables for the Australian and Korean subsidiaries have significant coefficients ( $\beta=.19$  and  $.17$ , respectively,  $p<.05$ ) and Dutch subsidiaries have a marginally significant coefficient ( $\beta=.15$ ,  $p<.10$ ).

**Independent Variables.** The results displayed in Table 3 also show that corporate context variables (Figure 1) are significant ( $\Delta R^2=.12$ ,  $p < .001$ ) and have the predicted signs. GSM is positively and significantly associated with SUBENT ( $\beta=.49$ ,  $p<.01$ ), which supports hypothesis 1. Autonomy ( $\beta=.22$ ,  $p<.05$ ) and strategic controls ( $\beta=.38$ ,  $p<.01$ ) were positive and significantly associated with entrepreneurship. These results support hypotheses 2 and 3, respectively. Contrary to hypothesis 4, financial controls are not significant but have the predicted negative sign ( $\beta=-.04$ ). Similarly, Table 3 also indicates that local environmental context variables are significant ( $\Delta R^2= .07$ ,  $p<.001$ ) and that dynamism, hostility and complexity are all positively and significantly associated with SUBENT in Step 3 ( $\beta=.23, .20, .29$  respectively,  $p<.05$ ), which supports hypotheses 5, 6, and 7, respectively.

## DISCUSSION

The role of subsidiaries within the MNCs' networks has undergone significant changes in the recent past (Bartlett & Ghoshal, 1998; Roth & Morrison, 1992). These changes have increased pressures on subsidiaries to become more entrepreneurial (Prahalad, 1999). However, little empirical research has examined the factors that determine variations in subsidiaries' entrepreneurial activities (Wright, 1999). This study has attempted to fill this gap in the literature, focusing on the impact of the corporate and local market contexts of a subsidiary's operations on its future entrepreneurship. In doing so, the study makes two contributions to the literature. First, it advances an international management framework that considers the integration needs of the HQ with the responsiveness needs of the local environment to the context of

entrepreneurship. Second, it focuses on an ignored subsidiary activity of entrepreneurship and extends entrepreneurship into the international domain. As hypothesized, both the corporate and local environmental contexts were associated with subsidiary entrepreneurship. Overall, the results support the hypotheses with the exception of financial controls. In this section, we will discuss the study's key findings.

**The Importance of Corporate Context (Hypotheses 1 through 4).** The results highlight the importance of subsidiaries' strategic context for stimulating entrepreneurship. Consistent with theory (Birkinshaw & Hood, 1997; Miller, 1983; Morrison & Roth, 1992), a global subsidiary mandate is positively associated with SUBENT. The results support hypothesis 1. The positive and significant relationship between GSM and SUBENT is important because MNCs stand to gain considerable advantages from their subsidiaries' initiatives (Birkinshaw & Hood, 1998). Thus, as argued earlier, it appears that GSM exposes subsidiaries to multiple resource bases and different innovation systems within the MNC network. GSM also provides critical linkages with customers and vendors along with increased responsibility for manufacturing and marketing. Consequently, as theory suggests and our results show, subsidiaries with global mandates are more likely to initiate entrepreneurial activities.

The subsidiary's autonomy and control systems also matter with respect to subsidiary entrepreneurship. Consistent with hypothesis 2, autonomy is a significant predictor of SUBENT. This finding is consistent with Birkinshaw's (1998) expectations and prior research (Barringer & Bluedorn, 1999; Miller, 1983; Jennings & Seaman, 1991). It appears that if a subsidiary's managers have more autonomy from their parent MNC, they are better empowered to support entrepreneurship. Subsidiary managers, therefore, are more likely to be proactive and innovative as they are not dependent on the parent organization. These managers have incentives to encourage and support entrepreneurship to strengthen their subsidiary's track record and accomplishments, further increasing its potential bargaining power with its parent MNC. Successful entrepreneurship can also improve the subsidiary's reputation, thereby increasing the professional standing of subsidiary managers. Entrepreneurship can also safeguard against

the potential loss of the subsidiary's global mandate. Either way, a subsidiary and its parent MNC stand to win from the entrepreneurial initiatives undertaken in the subsidiary.

Another noteworthy finding from this study is the positive association observed between the use of strategic controls and SUBENT. These results support hypothesis 3 and are consistent with prior strategy research (e.g., Barringer & Bluedorn, 1999; Hitt et al. 1991). Strategic controls usually involve the use of informal communication systems, subjective appraisal criteria, and longer time horizons. These controls may make executives more comfortable with adopting a long-term view in making decisions about innovation and new venture creation, thereby fostering entrepreneurship (Porter, 1992). Thus, while prior researchers have noted the importance of cultural (normative) and strategic controls for maintaining an effective MNC, the current results extend the literature by documenting a significant and positive association between these controls and future SUBENT.

The results fail to support hypothesis 4, which suggests financial controls are negatively associated with SUBENT. Financial controls rely on the use of objective criteria in highly formalized performance appraisal systems. As such, we proposed that the use of such controls would encourage subsidiary managers to take a short-term perspective that would discourage risk taking and innovation. Though the financial controls measure was negatively related to SUBENT, it was not statistically significant.

The results for financial controls contradict prior findings using the same measures. Specifically, the results are inconsistent with those reported in the literature (Barringer & Bluedorn, 1999; Johnson et al., 1996; Hitt et al., 1991). These results may be sample-specific. Alternatively, financial controls cannot be effectively used in the international context due to fluctuations in currency rates and differences in accounting standards across countries. It is also possible that the impact of financial controls is overshadowed by other variables in the analyses, particularly autonomy and strategic controls. When the subsidiary has a great deal of autonomy from its parent MNC, the adverse effect of financial controls on SUBENT may decline. If this is true, there may be a compensatory effect between autonomy and financial

controls. The same logic applies to strategic controls. However, post hoc analyses proved to be fruitless. However, when autonomy, strategic controls or both are excluded from the regression equation, the pattern of relationships reported in Table 3 remains in tact. Clearly, the non-significant association between financial controls and SUBENT contradicts the literature and should be examined closely in future studies.

**The Importance of Environmental Context.** The results also reinforce the importance of the subsidiary's local environmental context for promoting entrepreneurship. The results support hypotheses 5 through 7, indicating that environmental turbulence is positively associated with entrepreneurship. As argued earlier, competitive environments provide more incentives for entrepreneurship at the subsidiary level. In fact, in some circumstances, entrepreneurial behavior may be the key to survival in a turbulent environment. Increased environmental turbulence stimulates entrepreneurship as competitive pressures encourage subsidiaries to innovate and take calculated risks. Our results support some past research (e.g., Barringer & Bluedorn, 1999; Miller, 1983; Zahra, 1991). It is, therefore, plausible to propose that the perceived dynamism, hostility and complexity of a subsidiary's competitive environment can spur entrepreneurship by promoting innovation and venturing.

**Limitations.** The above results should be interpreted with caution for several reasons. The study has focused on subsidiaries of foreign countries operating in the US and therefore may not be generalizable to subsidiaries operating in other countries. The dynamism of the US markets and their unique structures may also limit the generalizability of the results to other countries. The sample might also suffer from survivor bias, as many subsidiaries fail during the early years of their operations. Further, the study has focused on selected variables that determine the corporate context of the subsidiary. It has ignored a direct examination of the reward system that exists in the subsidiary, the characteristics and skills of top managers, or the type (or frequency) of communication between the parent MNC and the subsidiary. These variables may also determine entrepreneurship within a subsidiary.

**Managerial Implications.** The results have three specific implications for the executives of MNCs. First, MNCs need to use strategic mandates judiciously within the organizational network to provide enabling conditions for entrepreneurial behavior. The HQ should be cognizant of the resource availability at the subsidiary level as well as the capabilities in scanning, acquiring, and utilizing information available within the MNC network, from varied national innovation systems, and from suppliers and vendors. Such knowledge flows could be directed by information systems or effective human resource practices and personnel transfers in order to foster innovation.

Second, the results highlight the importance of a subsidiary's autonomy and its use of strategic controls for enhancing entrepreneurship. These results also reinforce calls for greater attention by MNC executives to design effective structures that provide the subsidiary with autonomy while maintaining effective coordination with the parent MNC. Strategic controls can also promote the subsidiary's willingness to engage in entrepreneurial activities. These controls should be connected to the MNC's culture and value system, making it possible to promote a long-term orientation in the MNC's operations.

Finally, the HQ may need to be aware of the importance of local managers' perceived environmental turbulence for SUBENT. Therefore, to spur entrepreneurial behavior, environmental characteristics should be considered along with other factors affecting location decisions, the nature and scope of subsidiary mandates, and the choice of control mechanisms. The results highlight the importance of effective environmental scanning and analysis in discerning trends and understanding their consequences for a firm's operations. Environmental scanning can be useful in identifying ideas or a new venture for future entrepreneurship.

**Implications for Theory and Future Research.** This study also suggests several ideas for future research. Specifically, while a subsidiary's mandate and its perceptions of the environment are important sources of influence in determining the corporate context of SUBENT, other variables need attention. The strategic priorities and competitive posture of the subsidiary also deserve exploration because they can

shape its entrepreneurial initiatives. It is also important to validate the results regarding the use of financial controls, using other samples and/or measures. Further, there is a need to evaluate the effect of a subsidiary's organizational cultural values and their influence on SUBENT (Kanter, 1988). Relatedly, the interaction of national and organizational cultures on SUBENT should also be explored (Morris et al., 1994).

## **CONCLUSIONS**

The contributions of entrepreneurship as the engine of economic growth and profitability in the contemporary MNC are well recognized. However, the importance of entrepreneurship within multinational subsidiaries has not received sufficient attention in prior research. This study combines insights from the strategy, international management and entrepreneurship fields to highlight the importance of strategies and structures that can spur and foster entrepreneurship within subsidiaries. The results add to the literature by recognizing the importance of global subsidiary mandates, environmental turbulence, autonomy, and strategic controls in influencing entrepreneurial initiatives of MNC subsidiaries.

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**Table 1**  
**Overview of the Study's Measures (N=227)**

Variables	Number of items	Mean	S.D.	Alpha	IRR (n=101) †
Global subsidiary mandate [GSM]	4	2.87	1.04	.77	.81
Environmental dynamism	5	3.17	0.97	.72	.63
Environmental hostility	7	3.04	1.05	.63	.59
Environmental complexity	4	3.33	1.14	.68	.57
Subsidiary autonomy	6	3.06	0.87	.73	.69
Strategic controls	3	2.81	1.44	.78	.56
Financial controls	3	3.01	1.02	.81	.66
Subsidiary age	1	23.19	12.06	NA	.93
Subsidiary size (log full time employees)	1	3.75	2.14	NA	.89
Past subsidiary performance	4	3.17	1.11	.90	.64
Technological opportunities	1	2.37	1.85	NA	NA
Subsidiary entrepreneurship 1995 1999)	9	3.19	1.12	.81	.71
	9	3.04	1.19	.82	.73

†IRR= Inter-rater agreement (measured by simple r)  
NA= Not applicable.

**Table 2**  
**Zero-order Correlations (N=227)**

Variables	1	2	3	4	5	6	7	8	9	10	11	12
(1) Global subsidiary mandate.	1											
(2) Environmental dynamism.	.25*	1										
(3) Environmental hostility.	-.09	.24*	1									
(4) Environmental complexity.	.21*	.29**	.34**	1								
(5) Subsidiary autonomy.	.31**	.27**	.21*	.27**	1							
(6) Strategic controls.	.19*	.17*	.15 <sup>†</sup>	.20*	.08	1						
(7) Financial controls.	.03	.23*	.10	.29**	.23*	-.31**	1					
(8) Subsidiary age.	.12	-.07	-.14 <sup>†</sup>	-.21*	.19*	.23*	-.19*	1				
(9) Subsidiary size.	.18*	-.09	-.19*	.16*	.27**	.18*	.24*	.27**	1			
(10) Past subsidiary performance.	.02	.11	-.15 <sup>†</sup>	-.19*	.23*	.17*	-.25*	.13 <sup>†</sup>	.19*	1		
(11) Technological opportunities.	.17*	.23*	-.04	.11	.19*	.18*	-.08	.25*	.21*	.23*	1	
(12) Subsidiary entrepreneurship (1999)	.23*	.26**	.17*	.21*	.26*	.12	-.03	-.03	.07	.17*	.14 <sup>†</sup>	1

<sup>†</sup>p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001

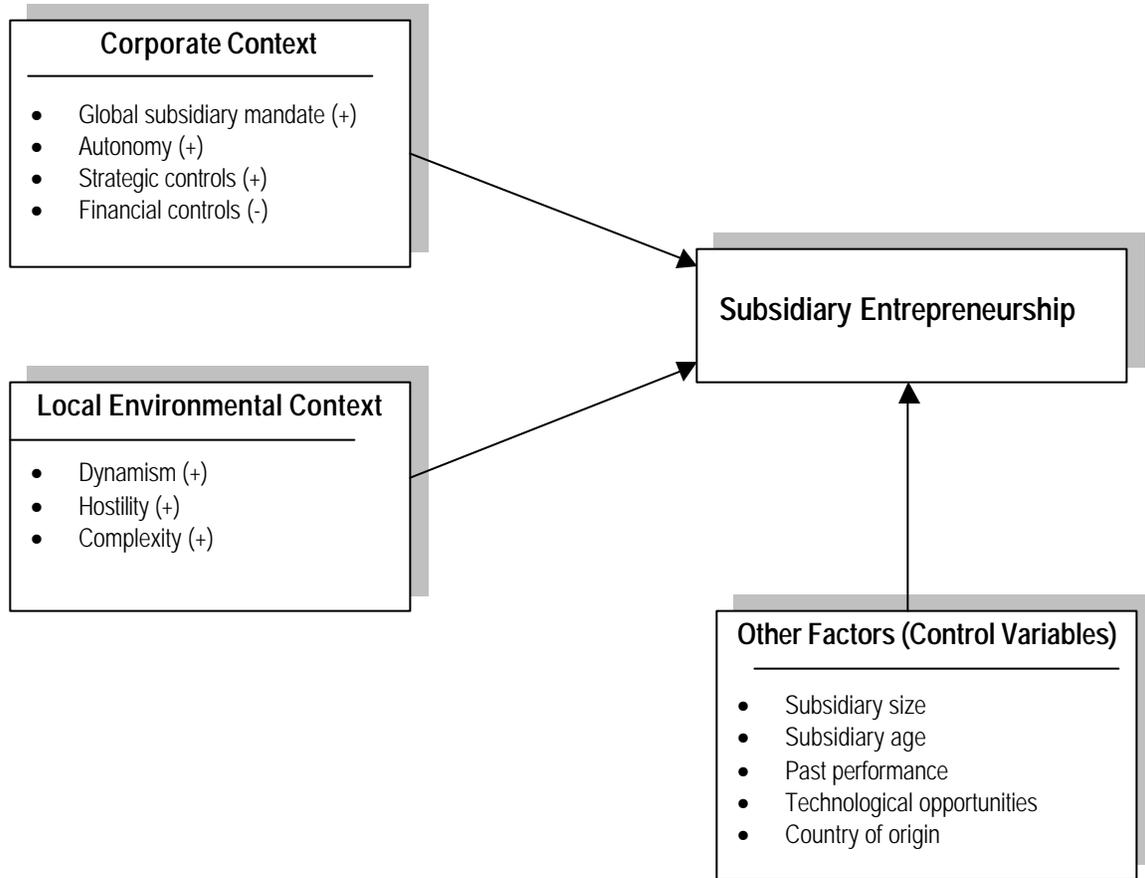
**Table 3**  
**Results of Regression Analysis (N=227)**  
**(Dependent Variable = Subsidiary Entrepreneurship)**

Step	Variables	Model 1	Model 2	Model 3
1	<b>Controls</b>			
	Subsidiary size (log)	-.09	-.11	-.06
	Subsidiary age	-.11	-.10	-.05
	Past subsidiary performance (adjusted)	.08	.03	.03
	Technological opportunities in industry	.09	.08	.15 <sup>†</sup>
	Australian subsidiary (dummy)	.19*	.21*	.19*
	British subsidiary (dummy)	-.08	-.07	-.04
	Dutch subsidiary (dummy)	.07	.11	.15 <sup>†</sup>
	French subsidiary (dummy)	.14 <sup>†</sup>	.14 <sup>†</sup>	.05
	German subsidiary (dummy)	-.03	-.05	-.07
	Japanese subsidiary (dummy)	.04	.11	.09
Korean subsidiary (dummy)	.21*	.18*	.17*	
2	<b>Corporate Context</b>			
	Global subsidiary mandate (GSM)		.46***	.49***
	Autonomy		.29*	.22*
	Strategic controls (emphasis)		.35***	.38***
	Financial controls (emphasis)		-.07	-.04
3	<b>Local Market Context</b>			
	Environmental dynamism			.23*
	Environmental hostility			.20*
	Environmental complexity			.29**
	Adjusted R <sup>2</sup>	.10	.22	.29
	F-value	2.14*	6.17**	8.41***
	Change in Adjusted R <sup>2</sup>		.12***	.07***

Subsidiary entrepreneurship was measured using 1999 data, whereas independent and control variables were measured using 1995-96 data.

<sup>†</sup>p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001

Figure 1  
Factors Affecting Subsidiary Entrepreneurship



## Appendix

This appendix presents the study's measures. Reliability measures, gauged by Cronbach's- $\alpha$ , appears in Table 1. In all cases, respondents were asked to circle the one number that they believed best reflects their companies' situation over the three-year period preceding data collection. Respondents were also reminded that there were no correct or wrong answers.

### Subsidiary entrepreneurship

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Over the past 3 years, our subsidiary...

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| • Has become more innovative.  | 1 | 2 | 3 | 4 | 5 |
| • Has shown a great deal of tolerance for high risk projects.                                      | 1 | 2 | 3 | 4 | 5 |
| • Has used only "tried and true" procedures, systems or methods. [R]                               | 1 | 2 | 3 | 4 | 5 |
| • Has challenged its major competitors for market leadership.                                      | 1 | 2 | 3 | 4 | 5 |
| • Has taken bold and wide-ranging, strategic actions, rather than making minor changes in tactics. | 1 | 2 | 3 | 4 | 5 |
| • Has pursued long-term goals & strategies.  | 1 | 2 | 3 | 4 | 5 |
| • Has spent more on research & development than its competitors.                                   | 1 | 2 | 3 | 4 | 5 |
| • Has introduced many new products to the market.  | 1 | 2 | 3 | 4 | 5 |
| • Has been among the first to introduce new products to the market.                                | 1 | 2 | 3 | 4 | 5 |

[R] = reverse scores

### Autonomy

No Discretion (all decisions are  
made by the headquarters)

1	2
---	---

Absolute Discretion (Decisions are  
made by the subsidiary)

3	4	5
---	---	---

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| • Introduction of new products.             | 1 | 2 | 3 | 4 | 5 |
| • Hiring key subsidiary executives.         | 1 | 2 | 3 | 4 | 5 |
| • Identifying new customer groups.          | 1 | 2 | 3 | 4 | 5 |
| • Upgrading or upgrading existing products. | 1 | 2 | 3 | 4 | 5 |
| • Initiating experimental projects.         | 1 | 2 | 3 | 4 | 5 |
| • Modifying production processes.           | 1 | 2 | 3 | 4 | 5 |

## Financial controls

	Not used at all								Widely Used
	1	2	3	4					5
• Cash flow.									1 2 3 4 5
• Return on investment.									1 2 3 4 5
• Objective criteria, such as return on assets.									1 2 3 4 5
• Formal performance appraisal.									1 2 3 4 5

## Strategic Controls

	Not used at all								Widely Used
	1	2	3	4					5
• Formal face-to-face meeting with subsidiary managers.									1 2 3 4 5
• Informal face-to face meetings with subsidiary managers.									1 2 3 4 5
• Performance against subjective criteria, such as customer satisfaction.									1 2 3 4 5
• Long term (3 years or longer) performance.									1 2 3 4 5

## Global Strategic Mandate

	Not at all Characteristic								Extremely Characteristic
	1	2	3	4					5

Within our multinational company (MNC):

• Product development expertise rests within this subsidiary.									1 2 3 4 5
• Our subsidiary plays a key role in developing new products for other units.									1 2 3 4 5
• Our subsidiary maintains control over export marketing of products.									1 2 3 4 5
• International marketing costs are incurred by our subsidiary.									1 2 3 4 5
• Our subsidiary develops products for worldwide distribution.									1 2 3 4 5
• Our subsidiary markets its products worldwide.									1 2 3 4 5
• Our subsidiary has a worldwide global business mission.									1 2 3 4 5
• Our subsidiary has been the key source of many innovations that have been diffused throughout our MNC's markets worldwide.									1 2 3 4 5

## Environmental Turbulence

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree  
 1                                      2                                      3                                      4                                      5

IN YOUR MAJOR INDUSTRY (in the USA):

## Environmental Hostility

- Access to channels of distribution is difficult.                                      1    2    3    4    5
- Access to capital is difficult.    1    2    3    4    5
- Access to skilled labor is difficult.    1    2    3    4    5
- Access to raw material is difficult.    1    2    3    4    5
- Demand for industry products is declining.                                      1    2    3    4    5
- Cut throat competition is common.    1    2    3    4    5
- Customer loyalty is decreasing.    1    2    3    4    5

## Environmental Dynamism

- Speed of technological change is very high.                                      1    2    3    4    5
- Companies change their products quickly.    1    2    3    4    5
- R&D spending has increased.    1    2    3    4    5
- Rate of product innovation is high.    1    2    3    4    5
- Rate of innovation in production technology is high.                              1    2    3    4    5

## Environmental Complexity

- Customer groups differ significantly in their buying habits                      1    2    3    4    5
- A company must use many production systems to serve customers.              1    2    3    4    5
- A company must use many marketing systems to serve its customers.              1    2    3    4    5
- A company functions in a highly complex environment.                              1    2    3    4    5

## Past Performance

- |                     | Lowest 20%<br>in the industry<br>(1) | Next 20%<br>(2) | Middle 20%<br>(3) | Next 20%<br>(4) | Top 20%<br>in the industry<br>(5) |
|---------------------|--------------------------------------|-----------------|-------------------|-----------------|-----------------------------------|
| • Return on assets. |                                      |                 |                   |                 | 1    2    3    4    5             |
| • Net income        |                                      |                 |                   |                 | 1    2    3    4    5             |
| • Sales growth.     |                                      |                 |                   |                 | 1    2    3    4    5             |
| • Revenue growth    |                                      |                 |                   |                 | 1    2    3    4    5             |