An Empirical Investigation of Expatriate Utilization:
Resource–based, Agency, and Transaction Costs Perspectives

Danchi Tan
University of Illinois at Urbana−Champaign

Joseph T. Mahoney
University of Illinois at Urbana−Champaign

Abstract

This paper develops a new integrative framework explaining and predicting multinational firms’ international staffing decisions based on resource–based, agency, and transaction costs theories. In this framework, a firm considers (1) the relative values that expatriates / local managers can bring to the firm, and (2) the relative control that the firm is able to exercise over expatriates and local managers through managerial contracting, when making strategic international staffing decisions. Accordingly, we identify a set of target industry characteristics and multinational firm characteristics that are predicted to influence international staffing decisions, and we examine these decisions on a sample of 365 Japanese manufacturing subsidiaries in the United States.

We are grateful to Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson, and especially Sidney G. Winter for providing us with the data from their paper in Brookings Papers on Economic Activity (1987). We also thank Ruth Aguilera, Ayse Olcay Costello, Michael Hitt, Jeffrey Krug, Biing−Shen Kuo, James Mahoney, and Weijen Wen for their insightful comments and suggestions. The usual disclaimer applies. Financial support from the Center for International Business Education and Research (CIBER) at the University of Illinois at Urbana−Champaign, and Taiwan National Science Council is gratefully acknowledged. Published: 2002
AN EMPIRICAL INVESTIGATION OF EXPATRIATE UTILIZATION:
RESOURCE-BASED, AGENCY, AND TRANSACTION COSTS PERSPECTIVES

Danchi Tan
Assistant Professor
Department of International Trade
National Chengchi University
64, Chih-nan Rd., Sec. 2
Wenshan, Taipei 11623
Taiwan
Tel: +886 2 2939-3091 ext 81139
Fax: +886 2 2938-7699
Email: dctan@nccu.edu.tw

and

Joseph T. Mahoney
Associate Professor of Business Administration
College of Business
University of Illinois at Urbana-Champaign
339 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820
(217) 244-8257 (telephone)
(217) 244-7969 (fax)
josephm@uiuc.edu

We are grateful to Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson, and especially Sidney G. Winter for providing us with the data from their paper in Brookings Papers on Economic Activity (1987). We also thank Ruth Aguilera, Ayse Olcay Costello, Michael Hitt, Jeffrey Krug, Biing-Shen Kuo, James Mahoney, and Weijen Wen for their insightful comments and suggestions. The usual disclaimer applies. Financial support from the Center for International Business Education and Research (CIBER) at the University of Illinois at Urbana-Champaign, and Taiwan National Science Council is gratefully acknowledged.
AN EMPIRICAL INVESTIGATION OF EXPATRIATE UTILIZATION: RESOURCE-BASED, AGENCY, AND TRANSACTION COSTS PERSPECTIVES

ABSTRACT

This paper develops a new integrative framework explaining and predicting multinational firms’ international staffing decisions based on resource-based, agency, and transaction costs theories. In this framework, a firm considers (1) the relative values that expatriates/local managers can bring to the firm, and (2) the relative control that the firm is able to exercise over expatriates and local managers through managerial contracting, when making strategic international staffing decisions. Accordingly, we identify a set of target industry characteristics and multinational firm characteristics that are predicted to influence international staffing decisions, and we examine these decisions on a sample of 365 Japanese manufacturing subsidiaries in the United States.

Key words: Agency costs, transaction costs, resource-based theory, and expatriates.
INTRODUCTION

Human resources are important strategic assets within a multinational firm. Indeed, the effectiveness of human resource deployment influences the likelihood of generating and sustaining competitive advantages of a multinational firm and is therefore a fundamental issue for international business studies. A multinational firm can deploy two types of human resources to top managerial positions in its foreign operations – expatriates and local hires. In this paper, expatriates are defined as the home country and/or third-country employees sent by the headquarters. Local hires are host country employees (Daniels and Radebaugh, 2001).

Expatriates typically have developed firm-specific knowledge and firm-specific relationships. In contrast, local hires typically have local market knowledge and local business connections.

The research literature has discussed extensively the economic benefits and economic costs of expatriation (e.g., Black and Gregersen, 1999; Edström and Galbraith, 1977; Kobrin, 1988; Scullion, 1991), and a few empirical studies have explored the critical factors that lead to the use of expatriates and local hires (e.g., Boyacigiller, 1990; Harzing, 2001; Richards, 2001). In this research literature, it is generally suggested that expatriates can improve the multinational firm’s capability to transfer and control information, and that the factors that necessitate information transfer and control will also increase the propensity of a multinational firm to use expatriates. A premise underlying the research literature, and that is maintained in the current paper, is that the values of comparative economic contributions of expatriates and local hires influence the multinational firm’s human resource deployment decision in the foreign operation.

While the research literature has shed light on some factors influencing the international staffing decision, it has generally overlooked the impact of one distinct characteristic about human resources on this strategic decision. Specifically, human resources are under only limited
control by a firm (Coff, 1997). For example, employees can leave the firm; they can renegotiate employment contracts to their advantages; and they can also shirk on the job and opportunistically withhold critical information. When the firm has serious concerns over whether particular employees are willing to do as they are required, the firm may choose not to place these employees in particular managerial positions even if they may be the most capable employees. As a result, the concern of a multinational firm about its effective control of employees may affect the firm’s human resource deployment decisions. However, the research literature has not systematically considered how the objective of managerial resource control influences the multinational firm’s international staffing decision.

The current paper investigates the international staffing decisions of a multinational firm by simultaneously considering both potential contributions of expatriates and local hires and the limited control of a firm over these expatriates and local hires from the perspectives of resource-based, agency, and transaction costs theories. In particular, in addition to considering the comparative economic contributions that expatriates and local managers can bring to the firm under various contingencies, our new integrative framework addresses how a firm influences its overseas managerial actions *ex ante* by making the right governance choice (via its international managerial staffing decisions). Our research is complementary to previous research studies on human resource control that have primarily focused on *ex post* courses of action in which a multinational firm can exert control over the chosen governance (e.g., selecting and training expatriates) (e.g., Snell, 1992). We develop a set of hypotheses concerning the conditions that are likely to be associated with expatriate utilization, and we test these hypotheses on a sample of 365 Japanese subsidiaries in the United States.
THEORY AND HYPOTHESES

This paper investigates the international staffing decisions of a multinational firm. We first consider the relative potential values that expatriates and local hires can contribute to the firm from the perspective of resource-based theory. We then explore the relative contractual costs associated with expatriates and local hires.

Resource-Based Perspective of International Staffing Decisions

From the perspective of resource-based theory, a firm’s resources affect how the firm behaves and performs (Barney, 1991; Lippman and Rumelt, 1982). Since managerial resources play an important role in obtaining, utilizing, and developing a firm’s other productive resources (Penrose, 1959), the firm needs to deploy its managerial resources effectively.

Effective managerial resource deployment involves matching managers with the firm-level positions in which their skills are likely to be most valuable. A multinational firm may require managers of foreign operations to obtain local resources and to implement the multinational firm’s strategy. In addition, it may also require the managers to facilitate the transfer of local capabilities within the multinational network and to help pool and integrate these local capabilities into “transnational innovations” (Bartlett and Ghoshal, 2000). These managerial tasks may place differential values on various skills of managers. For example, obtaining local resources and capabilities may require the managers to be equipped with local knowledge and local business connections. Implementing the multinational firm’s strategy may require the managers to understand and to accept the subsidiary’s role within the multinational firm. Transferring capabilities within the multinational network may require the managers to
have intra-firm social capital; i.e., intra-firm relationships with other subunits within the multinational network.

Expatriates and local hires are two types of managerial resources that a multinational firm can deploy to the top managerial positions of its foreign subsidiaries. Upon the multinational firm’s initial entry into a foreign market, expatriates and local hires are expected to contribute different values to the multinational firm. Specifically, at the time when expatriates are offered international assignments, they are likely to have worked within, and to have been socialized within, the firm for a substantial period of time (Laing, 1994; Naumann, 1992). Consequently, expatriates are likely to have understood the corporate policy of the multinational firm, and to have developed intra-firm relationships within the firm (Kuemmerle, 1997). Such firm-specific capabilities enhance expatriates’ understanding of the subsidiaries’ roles within the multinational firm, and thus should increase their productivity in implementing the multinational firm’s strategy in the foreign subsidiaries. The firm-specific relationships of expatriates should also allow them to interact effectively with other subunits in the multinational network, and to improve the knowledge and information flow within the firm. In contrast, local hires have typically fewer working experiences within the multinational firm, and hence they have less firm-specific knowledge. Thus, local hires are expected to have developed fewer relationships relative to expatriates. However, these local hires are expected to have much greater local knowledge and local business connections, and hence these local hires are expected to allow the multinational firm to obtain valuable local resources and to adapt to local environments.

In other words, from the perspective of the resource-base theory, while both expatriates and local hires are valuable managerial resources that a multinational firm can deploy to the top managerial positions of its foreign subsidiaries, the two types of managerial resources have
different comparative advantages at different managerial tasks. When the key managerial tasks are to implement the multinational firm’s strategy, or to facilitate knowledge flow across different subunits of the firm, the skills of expatriates should better match these critical tasks and the firm is likely to place expatriates in the managerial positions of its subsidiaries. On the other hand, if obtaining local knowledge and making local adaptation are crucial managerial tasks, local hires should better fit these tasks and local hires are likely to be assigned to the managerial positions of the subsidiaries.

The need for local knowledge and local adaptation should be more important in consumer goods industries than in producer goods industries. In consumer goods industries, local resources, such as knowledge about local consumer behaviors and business connections concerning local distribution channels, should be more crucial to success for the multinational firm. Hence, we expect that:

**H1:** *Ceteris paribus, a multinational firm is likely to increase its utilization of expatriates in the foreign subsidiary in consumer goods industries more than in producer goods industries.*

The Agency Perspective of International Staffing Decisions

We have discussed how expatriates and local hires may potentially contribute differently to the economic value of a multinational firm. However, since human resources are under only limited organizational control, a multinational firm making international staffing decisions is likely to consider not only the potential economic *revenues* that expatriates and local hires could bring to the firm, but also the economic *costs* that a firm may incur in order to exert effective organizational control over expatriates and local hires.
Employment contracts provide the basis of control that a firm can have ex ante over its employees by broadly defining (within a zone of acceptance) what the firm demands from the employees (Williamson, 1975). When a multinational firm enters a foreign market, it can make managerial contracts with its internal managers (i.e., expatriates) and local hires. The costs associated with the contracting include not only the out-of-pocket costs such as compensation, but also the economic costs of the firm in specifying, adjusting, and enforcing the employment contracts, and any economic loss due to the (necessarily) incomplete contract. High contractual costs are likely to lead to incomplete contracting problems, which is likely to increase the multinational firms’ concern about its limited organizational control over managers. To investigate the relative contractual costs associated with expatriates and local hires, we first explore the contractual problems that a multinational firm potentially incurs when selecting managers for its foreign operations from the perspective of agency theory.

Agency theory is concerned with potential misalignment of economic incentives between a principal and an agent (Jensen and Meckling, 1976). Agency costs include the time and efforts that the principal and agent spend in resolving their conflicts of interests (which include monitoring costs by the principal and economic bonding costs by the agent), and the residual economic loss from unresolved conflicts.

The relationship between a multinational headquarters and the managers of its foreign subsidiaries is a type of principal-agent relationship, in which the headquarters is the principal whose interests are influenced by the agents; i.e., the managers of its foreign subsidiaries (O’Donnell, 2000). The managers of the foreign subsidiaries may not fully serve the headquarters’ economic interests due to the following reasons. First, there may be an economic incentive misalignment problem between the headquarters and the managers of the foreign
subsidiaries because the managers may pursue sub-goals and may not be motivated to promote fully the economic interests of the foreign subsidiaries, and the multinational firm may find it costly to monitor the self-seeking behaviors of the managers (Cyert and March, 1963; March and Simon, 1958; Mishra and Gobeli, 1998).

Second, when selecting the managers for its foreign subsidiaries, the multinational firm may have only limited understanding of the abilities and characteristics of the candidates, because some of the employee attributes are unobservable and could only be revealed through time and experience (Laing, 1994). As a consequence, the multinational firm may be uncertain about the quality of managerial services that these candidates are capable of providing, and may fail to place the right managers for the foreign subsidiaries (Rugman and Verbeke, 2001). In this case, even if managerial self-interest-seeking behaviors are circumvented, the selected managers may not have the required skills to promote effectively the interests of the foreign subsidiaries.

Third, even if the managers are willing and able to pursue the best economic interests of the foreign subsidiaries, they do not necessarily promote the best economic interests for the multinational firm as a whole, because the best economic interests of the foreign subsidiaries and the best economic interests of the multinational firm may not be identical (i.e., there is an economic incentive misalignment situation between the headquarters and the foreign subsidiaries) (Hennart, 1991a; Kobrin, 1988). One dramatic example would be when it is in the headquarters’ economic interests to shut down a particular foreign operation in order to rationalize its worldwide production.

Expatriation potentially provides a solution to these agency problems. Since expatriates generally have worked and socialized within the multinational firm for a period of time, they have established track records and they have been typically put to work on various tasks so that
the multinational firm has assessed their less observable abilities and characteristics (Bonache and Fernandez; 1999; MacLeod and Malcomson, 1988). In contrast, local workers have typically fewer working experience within the firm than expatriates. In addition, language and cultural barriers, and lack of information collecting systems may make it difficult for the multinational headquarters to access the characteristics of local workers. Thus the multinational firm is expected to be less uncertain about the characteristics of expatriates than about the characteristics of the workers in the local labor market.\(^1\) In addition, since expatriates have been socialized within the multinational firm, they are expected to better understand and accept the role of the subsidiaries within the multinational network and to better maintain the headquarters’ economic interests than local personnel (Eisenhardt, 1985; Kobrin, 1988; Ouchi, 1979). The use of expatriates thus potentially reduces the information asymmetry problem that a multinational firm would face in recruiting managers for its overseas operations, and reduces potential incentive misalignment problems between the headquarters and the foreign subsidiaries.

The conflict of economic interests between the headquarters and its foreign subsidiaries is likely to be higher in global industries. A global industry is one in which a firm’s competitive position in one country is significantly affected by its position in other countries (Porter, 1986). The high interdependency within a multinational firm often requires the firm to rationalize its production processes and to coordinate its activities worldwide, such as coordination of pricing, product positioning, service standards, and sourcing (Roth and Morrison, 1992). The coordination and rationalization process, while crucial for the overall success of the

---

\(^1\) It should be noted that some empirical studies suggest that roughly 10-20% of expatriates are free agents and have not had much experience with the firm prior to their assignment. However, since these free agents share the same languages with the MNE top managers, the MNE may find it easier to assess their ability through interviews than they can evaluate the ability of locals.
multinational firm, may not maximize and may even harm the economic interests of individual subsidiaries (Hennart, 1991a). Expatriates are expected to have a better understanding of individual subsidiaries’ roles in the multinational firm and they should be more committed in maintaining the headquarters’ policies than local personnel. We therefore expect that:

**H2:** *Ceteris paribus, a multinational firm is likely to increase its utilization of expatriates in the foreign subsidiary in industries characterized by a high extent of globalization.*

**Transaction Costs Perspective of International Staffing Decision**

We next investigate the relative contractual costs associated with expatriates and local hires from the perspective of transaction costs theory. Transaction costs theory is concerned with relative efficiency of governance choices in organizing economic activities (Williamson, 1985). Expatriates and local hires are two governance choices for providing managerial services in foreign operations. Making managerial employment contracts with either governance may potentially give rise to *ex ante* and *ex post* contractual costs. Both costs may increase the multinational firms’ concern about its limited organizational control over managers.

One source of *ex ante* costs of managerial employment contracting arises from the difficulty in specifying exhaustive criteria for recruiting the right managers for foreign operations. Such a difficulty is expected to predominate when the market in which the multinational firm chooses to enter is subject to high uncertainty (Boyacigiller, 1990), because uncertainty makes it difficult for the multinational firm to anticipate the required abilities, and thus the qualifications, that the managers of the foreign operation should be equipped with.
Therefore, managers may have to adapt to tasks (e.g., restructuring) that they were not informed of prior to their assignments.

Thus, when a high level of uncertainty characterizes the market, the multinational firm may prefer to select managers who are expected to be more loyal and who are willing/able to adapt to various contingencies (Pearce, 1997; Tung, 1982). However, such individual characteristics are imperfectly observable and can only be fully known through experience over time. Since the firm is likely to have greater knowledge about the imperfectly observable characteristics of its internal managers than local hires, the use of expatriates may reduce the ex ante incomplete contracting problem arising from uncertainty in the target market. Such a reduction in uncertainty may help reduce the multinational firm’s control concern over its managers of foreign operations.

However, in uncertain markets, local hires may potentially create greater values than expatriates for the foreign subsidiaries because they have greater local knowledge and local business connections that allow the multinational firm to adapt to contingencies and to buffer risks (Miller, 1992). Thus, an alternative hypothesis is that high uncertainty will lead to a lower utilization of expatriates in the foreign subsidiary. Given these conflicting theories, we therefore, suggest alternative hypotheses:

**H3a:** Ceteris paribus, the level of uncertainty of an industry is likely to be positively associated with a firm’s utilization of expatriates in its foreign subsidiary.

**H3b:** Ceteris paribus, the level of uncertainty of an industry is likely to be negatively associated with a firm’s utilization of expatriates in its foreign subsidiary.

Another source of ex ante costs of managerial employment contracting arises from a smaller-numbers bargaining condition, which occurs when qualified managerial candidates are
scarce. Such a contractual problem may occur in both the local managerial labor market (i.e., the market for local hires) and the firm’s internal managerial labor market (i.e., the market for expatriates). The greater the contractual problems the firm potentially faces in a managerial labor market, the less likely that the firm will rely on the market for searching managers to serve the foreign operation. For example, a firm with few internal managers qualified for international management is likely to rely more on local hires than on expatriates to serve its foreign subsidiaries.

A firm with a great multinational diversity is likely to be less subject to such a small numbers bargaining problem in its internal managerial labor market. Specifically, a firm that operates in a variety of countries can provide diverse learning opportunities for its managers (Hitt, Hoskisson, and Kim, 1997). Consequently the managers can develop multi-lingual abilities and local adaptation capacities (Luo and Peng, 1999; Zahra, Ireland, and Hitt, 2000), and they can become qualified as managers of foreign subsidiaries. Since a firm with a greater multinational diversity is likely to have more internal managers qualified as candidates for managerial positions in foreign operations, we expect that,

**H4:** *Ceteris paribus, a multinational firm with a greater multinational diversity is likely to increase its utilization of expatriates in its foreign subsidiary.*

The small-numbers bargaining problem can also occur in the market for local hires, even in countries where local talents are abundant. Specifically, a multinational firm may require managers of its foreign operations to be equipped with firm-specific knowledge and firm-specific relationships (Master and Miles, 2002). Since firm-specific abilities and firm-specific relationships can only be developed within the firm through learning by doing and intra-firm interactions (Williamson, 1985), when the degree of firm-specificity in the required managerial
capabilities is high, the multinational firm is likely to have difficulties in finding qualified local hires and may have to rely on expatriates to provide managerial services.

Transferring tacit knowledge within the multinational firm requires managers of foreign operations to be equipped with a high extent of firm-specific capabilities (Subramaniam and Venkatraman, 2001). First, because tacit knowledge is not currently or easily codifiable, its transfer requires the transferors to demonstrate their knowledge on the job and to give comments on the errors made by the transferees in the process of imitating the transferors (Teece, 1998). Therefore, transfer of tacit knowledge requires a high level of interaction within the multinational firm. To facilitate such interaction, the units within the multinational firm may have to share similar languages and understanding, and to build informal social links with other units (Winter, 1987). Such intra-firm relationships are firm-specific capabilities that need to be developed through experiences within the multinational firm (Harvey, Speier, and Novicevic, 1999). Therefore,

\textbf{H5: Ceteris paribus, a multinational firm is likely to increase its utilization of expatriates in its foreign subsidiary in industries characterized by a high extent of knowledge tacitness.}

In addition to ex ante contractual problems such as uncertainty and a small-numbers condition, a multinational firm facing international staffing decisions may also consider an ex post contractual problem when managers attempt to renegotiate the terms of the employment contracts (such as compensation and position) in their favor. If managers have greater bargaining power vis-a-vis the firm (Milgrom and Roberts, 1992), the firm may be forced to accept worsening terms of the employment contracts.
One condition in which managers may have greater bargaining power is that the firm has made substantial irreversible investments specific to managers by the time the managers renegotiate the contracts, because the firm cannot recover such investments once the managers leave the firm. For example, a firm may provide considerable training to its managers. If the training (such as technical skills and language training, outside social network introduction) can be valuable to other firms, the managers may threaten to leave the firm and to serve its competitors. In this case, the firm’s risk of having lower bargaining power than managers is likely to be substantial (Allen and Alvarez, 1998; Black, Gregersen and Mendenhall, 1991; Williamson, 1975).

However, the firm is not the only party who may incur loss if the employment contract is terminated; managers may also incur an economic loss. For managers, their firm-specific knowledge and firm-specific relationships that have accumulated through experience with the firm are irreversible investments that they commit to the firm. If they leave for other firms, such knowledge and relationships would lose at least a part, if not all, of their economic value (Becker, 1964). Firm-specific knowledge and relationships that managers have developed within the firm therefore increases the switching costs of managers and reduce the firm’s risk of having lower bargaining power than managers.

The bargaining problems from renegotiating managerial employment contracts may occur for both expatriates and local hires. However, the economic contractual hazards of using expatriates are likely to be smaller than those of using local hires. Specifically, expatriates have typically spent more time with the multinational firm. Their skills, knowledge, and relationships are tailored to the firm to a greater extent than local managers, and thus they have more to lose than local hires once their employment relationship with the firm is terminated (Liebeskind,
Similarly, the firm has made more irreversible investments in expatriates than it does in local hires. Hence the mutual economic interests for maintaining a long-term relationship are stronger between the multinational firm and expatriates than between the firm and local hires. The multinational firm may mitigate potential bargaining problems by using expatriates.

Expatriates’ investments in building firm-specific capabilities can be seen as credible commitments in supporting their cooperative relationships with the multinational firm, reducing the need of the firm for monitoring them (and hence the economic costs of enforcing employment contracts). The need for monitoring managers should be greater the more important it is for the firm to protect its core competencies, such as technology and reputation, from leakage or erosion. The use of expatriates may alleviate the multinational firm’s concern that the managers may take the technology and leave for other firms, or to free-ride on the firm’s reputation. A firm’s technologies and reputation are often characterized by its R&D and advertising intensities (Caves, 1996). Therefore,

\[ H_6: \text{Ceteris paribus, a multinational firm with higher R&D intensity is likely to increase its utilization of expatriates in the foreign subsidiary.} \]

\[ H_7: \text{Ceteris paribus, a multinational firm with higher advertising intensity is likely to increase its utilization of expatriates in the foreign subsidiary.} \]

\[ ^2 \text{Research has shown that many expatriates leave their firms within a few years after their return to the parent firm (Daniels and Radebaugh, 2001). We believe that typically both multinational firms and expatriates consider the turnover a loss of their investments in the mutual relationship. The cost of losing a repatriated employee has been estimated to be $1.2 million (Black, Gregersen and Mendenhall, 1991). We maintain that multinational firms should provide better economic incentives (e.g., better repatriation plans) to retain their expatriates and hence retain their investments in these expatriates.} \]
METHODOLOGY

Our hypotheses identify a set of target industry characteristics and multinational firm characteristics that may influence the international staffing decisions. To test these hypotheses, we limit our sample to one target market (the United States) so that the data on industry characteristics can be comparable. As the world’s largest FDI inflow receiver, the US market is an exemplar of a competitive environment with well-defined property rights. Due to data accessibility and control purposes, we also limit our sample to the subsidiaries from multinational firms of the same nationality (Japan).

This sample is appropriate for the current study for the following reasons. First, since cultural differences may affect a firm’s human resource management policies, mixing subsidiaries from different nationalities would be highly problematic for testing our hypotheses. Second, although Japanese multinationals in general have a higher tendency of expatriate utilization (Pucik, 1999), this does not invalidate our analyses because what we are interested in is not to what extent a firm utilizes expatriates; instead, we are to explain the variation of firms’ propensities of expatriation, and our hypotheses predict what industry and firm characteristics may affect a firm’s propensity of expatriation. As long as there are meaningful variations in the propensity of the sample firms in expatriate utilization, as shown later in our study, our sample provides a good basis for testing our hypotheses. Third, Japanese multinationals play an important role in the world economy. Studying how they manage overseas operations can provide valuable academic and practical contributions (Beamish and Delios, 2001; Beechler and Bird, 1999; Johansson and Yip, 1994). Fourth, international business research has been notorious for its difficulties in finding reliable, comparable, and complete secondary data. Focusing on
Japanese overseas subsidiaries allow us to access comparable and relatively reliable parent firm characteristics.

Our initial sample consists of all 828 US manufacturing subsidiaries (with employment over 20 people) as of 2001 by Japanese firms that were listed in the first and second sections of the Japanese stock exchange and that are not trading companies. The list of Japanese subsidiaries is obtained from a census of Japanese investments in the United States undertaken by Toyo Keizai Publication. In addition to the names of the subsidiaries, the census also provides information on the parent name(s), ownership share, entry year, employment, and products. The source also gives the number of expatriates for some of the subsidiaries. As will be described in detail, all the firm and industry variables are collected from secondary sources. Lack of data on subsidiary products, the number of expatriates, and firm and industry variables reduces our final sample to 365 subsidiaries.

The dependent variable is the utilization of expatriates in a subsidiary. We measure our dependent variable by (1) the number of expatriates (\(\text{EXPAT}\)) that are sent by the Japanese headquarters to the U.S. subsidiary; and (2) a dummy (\(\text{JPN}\)) that is equal to one if the nationality of the top manager of the subsidiary is Japanese (Harzing, 2001).

**Explanatory Variables**

**CONSUMER** is the percentage of shipments that go to non-manufacturers in a US industry (source: U.S. *Census of Manufactures*). It is a proxy for consumer goods industries. We expect that in consumer goods industries, local knowledge and local business connections are crucial and that firms tend to rely less on expatriates. Thus, the coefficient of **CONSUMER** is expected to be negative.
We follow Makhija, Kim, and Williamson (1997) to measure globalization of a US industry by (1) the extent of an industry’s international linkages (LIT), and (2) the integration of value-added activities within the industry (IIT). LIT is the proportion of international trade (import plus export) to the total consumption of the industry. IIT indicates the intra-industry trade as a proportion of the total trade in the industry. The data on the import and export of US industries are obtained from Feenstra (1997). Firms in highly global industries are expected to rely more on expatriates in order to coordinate their international operations effectively. We therefore expect the coefficient of LIT and the coefficient of IIT to be positive.

UNCERTAIN is a proxy for the extent of demand uncertainty of a U.S. industry. Following Levy (1985), we regress the logarithm of the real shipments of the U.S. industry entered by the Japanese parent firm from 1991 to 2000 on \( t \) where \( t \) ranges from 1 to 10 (source: U.S. Bureau of Economic Analysis). The variance of the error term is used as the measure for industry uncertainty. Firms in highly uncertain industries are likely to influence the utilization of expatriates in their foreign subsidiaries.

We follow Barkema and Vermeulen (1998) and Zahra, Ireland, and Hitt (2000) and measure multinational diversity (MULTI) by the number of countries in which a firm established manufacturing affiliates prior to 2001. A firm with greater multinational diversity should have more managers with international managerial skills and should increase its utilization of expatriates. The coefficient of MULTI is expected to be positive.

TACIT is a proxy for the extent of tacitness of knowledge in a U.S. industry. We expect the coefficient of TACIT to be positive. Responses to the survey of Levin, Klevorick, Nelson and Winter (1987) are used to measure the tacitness of the knowledge in a given U.S. industry. TACIT is the average score of the following items from their questionnaire: (1) the extent to
which patents secure royalty income for product and process innovations (inversely coded),

(2) the importance of moving quickly down the learning curve as a means to appropriate product
and process innovation, and (3) the extent of limitation on the patentability of new processes or
products. In addition to an overall measure for tacit knowledge, we also distinguish between
tacit process knowledge and tacit product knowledge. **TACIT-PROCESS** is the proxy for tacit
process knowledge. It is the average score of the above three questionnaire items for process
innovations only. **TACIT-PRODUCT** is the proxy for tacit product knowledge. It is the average
score of the items for product innovation.

A firm’s R&D (**R&D**) and advertising (**ADV**) intensities are measured by R&D
expenditure divided by sales and advertising expenditure divided by sales. Firms with higher
R&D intensity and firms with higher advertising intensity are likely to rely more on expatriates.
The coefficients for both variables are, therefore, expected to be positive. Data are obtained from
the COMPSTAT (Global) and the Nikkei NEEDS databases.

**Control Variables**

In addition to the variables identified in the hypotheses, there are other variables that can
potentially influence the decision of a firm using expatriates. **ACQ** is a dummy that is equal to
one if the entry is an acquisition, and zero otherwise. A firm may rely less on expatriates in
acquired subsidiaries in order to avoid potential resistance from employees of the acquired
companies (Olie, 1990). **AGE** is the (natural log) number of years since the Japanese firm
established the subsidiary in the United States. A firm may rely less on expatriates in older
subsidiaries since it should be more certain about the U.S. managerial labor market. **SIZE** is the
(natural log) number of employees of the U.S. subsidiary. A firm may send more expatriates to
manage a larger subsidiary.
RESULTS AND DISCUSSIONS

Table 1 provides the descriptive statistics and correlations. With the exception of the correlation between the tacit process and the tacit product variables and the correlation between LIT and UNCERTAIN there were no highly correlated variables indicating that multicollinearity is not a substantial problem in our data set.

Our hypotheses consider the conditions that are likely to affect the utilization of expatriates in Japanese subsidiaries in the US. Table 2 presents the results of the empirical models using the number of expatriates as the dependent variable. Table 3 presents the results of the models in which the nationality of the top manager of a subsidiary is examined. In both tables, a positive coefficient of a variable indicates an increase in the likelihood of expatriate utilization. The first columns of both tables show the results using LIT (an industry’s international linkage) as the measure for globalization of an industry, while the second columns report the results using IIT (an industry’s integration of value-added activities) as this measure. We discuss these results jointly.

H1 predicts that a multinational firm tends to rely more on expatriates in consumer goods industries. However, the coefficients of CONSUMER in Columns 1 and 2 of both tables are not significant. Therefore, H1 is not supported. One potential reason may be that in consumer goods industries local knowledge and local business connections are crucial for the success of multinational firms and hence the opportunities for organizational learning are great. Japanese multinational firms may have sent expatriates to the US subsidiaries in order to develop their managers (Kopp, 1999).
H2 predicts a positive association between industry globalization (proxied by *LIT* and *IIT*) and expatriate utilization. The coefficient of *LIT* is positive and significant in Table 2 while the coefficient of *IIT* is positive and significant in Table 3. Combining both results, it suggests that when the level of international linkage of a US industry (*LIT*) is high, Japanese multinational firms tended to send more expatriates to their US subsidiaries, and that when the level of integration of value added activities of a US industry (*IIT*) is high, Japanese firms tended to appoint a Japanese top manager to the US operations. H2 is supported.

H3 predicts that a firm’s utilization of expatriates is likely to be influenced by the level of uncertainty about the target market. In Table 2, where the number of expatriates is examined, the coefficient of *UNCERTAIN* is positive and significant in Column 2 but not Column 1. We suspect that the reason why *UNCERTAIN* is not significant in Column 1 is that *UNCERTAIN* is highly correlated with *LIT* (correlation coefficient = 0.43), the measure for industry globalization. To verify this conjecture, we took out *LIT* from the model and found that *UNCERTAIN* indeed became significant and positive. While Table 2 shows that Japanese firms sent more expatriates to US subsidiaries in highly uncertain industries, Table 3 indicates that a Japanese firm tended *not* to appoint a Japanese national as the top manager to the US subsidiary in highly uncertain industries, as the coefficients of *UNCERTAIN* are negative and significant in Table 3. Perhaps such findings are due to the need for both expatriates and local managers in the presence of high uncertainty: In uncertain industries, Japanese firms may have relied more on expatriates to reduce incomplete contracting problems but they may have employed a local top

---

3 To further test the robustness of the result, we employed Kobrin’s (1991) measure of industry globalization and reached a consistent result (the coefficient is positive and significant) indicating the robustness in this empirical finding.
manager to obtain local resources to buffer risk. We conclude that, depending on the empirical context, both H3a and H3b are supported.

H4 predicts that a Japanese firm with greater multinationality is likely to rely more on expatriates. The empirical results support H4: The coefficients of \textit{MULTI} in both tables are positive and statistically significant. This empirical finding is consistent with our argument that a firm with higher multinationality is likely to be endowed with greater international managerial resources, which allows the firm to employ expatriates to manage its foreign operations.

H5 predicts a positive association between the tacitness of knowledge of an industry, and expatriate utilization. Contrary to theoretical expectations, the coefficients of \textit{TACIT} are not significant in both tables. One possible reason is that our measure for tacitness captures the extent of tacitness of both product and process innovations in U.S. industries. It is likely that the product knowledge is location-specific (for example, product innovations developed in the U.S. subsidiary are based on the preference of U.S. consumers), and hence is transferred to a lesser extent than process knowledge (Frost, 2001). \textit{If this is true, the association between tacitness and expatriate utilization is likely to be valid only when process, rather than product, knowledge is considered.}

To test such a conjecture, we replace the measure for \textit{TACIT} with our alternative measures, \textit{TACIT-PROCESS} and \textit{TACIT-PRODUCT}, and re-run the model. The empirical results are partially consistent with our conjecture: the coefficients for \textit{TACIT-PROCESS} are positive and significant at the 0.1 level in Column 4 of Table 2, and the coefficients for \textit{TACIT-PRODUCT} are not significant in columns 5 and 6 of Table 2. This empirical finding suggests that when the process knowledge is tacit, a firm is likely to utilize more expatriates to facilitate knowledge sharing and learning. We also did the same analyses for Table 3 but did not find
either variable significant, indicating that a Japanese firm did not tend to employ a Japanese national as the top manager of its foreign operations in industries characterized by tacit process/product knowledge. Perhaps it takes a group of managers, rather than one top manager, to facilitate tacit knowledge sharing within a multinational firm.

Hypotheses 6 and 7 predict that a firm transferring proprietary resources such as R&D or reputation is likely to utilize more expatriates in foreign subsidiaries. Consistent with H6, the coefficients of R&D are positive and significant in Columns 1 and 2 of Table 2, suggesting that Japanese firms with high R&D intensity have sent more expatriates to their US affiliates. However, the likelihood of using Japanese nationals as the top managers of the affiliates was not higher for these firms, as this coefficient is not significant in Table 3. It may be possible that protecting proprietary technologies requires a group of trusted managers. The coefficients of ADV are positive as expected but are not significant in both tables. Perhaps a firm’s reputation and brand names are often location-specific, and are not easily transferred across national borders (Hennart, 1991b). The need to protect reputation through expatriation may therefore be low. In addition, promoting reputation and brand names in foreign countries may need to be coupled with local knowledge and distribution (Simonin, 1999), and thus local managers can make valuable contributions.

We now turn to control variables. The coefficients of ACQ, a dummy variable indicating acquisition entry, are negative and significant in both tables. Japanese firms that entered into the U.S. industries by acquisition may have relied less on expatriates to avoid potential employee resistance from acquired companies. The coefficients of AGE are positive and significant in both tables, suggesting that the utilization of expatriates are greater in older Japanese subsidiaries. It may be possible that early Japanese investors in the US had poor information about the US
managerial labor market and thus had relied more on expatriates to manage their international operations. Another potential reason is that early Japanese investors had greater tendency to rely on expatriates (Pucik, 1999). Finally, the coefficients of \textbf{SUBSIZE} are positive and significant in Table 2, but are negative and significant in Table 3, indicating that for larger US subsidiaries, Japanese firms sent more expatriates, but tended to appoint non-Japanese nationals as the top managers.

\textbf{CONCLUSIONS}

This paper has developed a new integrative framework explaining multinational firms’ managerial staffing decisions of foreign operations based on resource-based, agency, and transaction costs theories. In this framework, a firm considers (1) the relative values that expatriates / local managers can bring to the firm, and (2) the relative control that a firm is able to exercise over expatriates and local managers through managerial contracting, when making the strategic international staffing decision.

\textit{Our empirical analyses indicate that managerial contractual incompleteness problems may influence a firm’s international staffing decisions.} In conditions where the contractual problems are likely to prevail, such as in global industries, in highly uncertain industries, in industries characterized by tacit process knowledge, transferring proprietary technologies, Japanese multinationals are found to have sent more expatriates to their US subsidiaries. We also found that the need for local resources also affect the staffing decision; as in highly uncertain US industries where local resources are important for buffering risks, Japanese multinationals are found to have assigned non-Japanese nationals as the top managers.
It should be noted that while non-economic factors, such as institutional impediments, may also influence or even dominate the essences of this governance choice, discussing these factors is beyond the scope of the current study. In addition, the empirical evidence on how the industry and firm characteristics influence international staffing decisions shown in this paper is based on Japanese subsidiaries in the United States. Future work can explore whether such results can be generalized to other contexts.

This paper contributes to the literature in the following ways. First, the current paper advances the understanding of international managerial transfer. Specifically, the extant research literature has presumed that expatriates can better achieve information transfer and control, and has used the factors that explain the need of information transfer and control to predict the use of expatriates. Such a presumption is dubious as expatriation is not always successful (see e.g., Ashmalla, 1998; Dolins, 1999) and can be very costly (Reynolds, 1997). The current paper replaces this presumption with more generalized, theoretically-grounded concepts such as potential economic values and contractual concerns that managers bring to multinational firms (Egelhoff, 1991; Tan and Mahoney, 2003).

Second, the current paper sheds new light and provides new evidence on the factors leading to the use of expatriates and local hires. Third, the current paper also sheds light on improving the efficiency of human resource deployment. Specifically, the paper indicates that due to the cost of contracting with local managers, a multinational firm may over-rely on expatriates even when expatriates may fall short of expectations. Accordingly, reducing contractual costs of utilizing local hires may improve efficiency in human resource utilization. The detailed discussion of the sources of contractual concerns over international employment contracts in the current paper could serve as a starting platform for exploring how to develop
mechanisms to reduce contractual concerns. Finally, human resources are one of the more important strategic resources of a multinational firm. However, the discussion of expatriate deployment has been primarily limited to human resource management scholars. We maintain that this issue deserves more attention from a wider audience, particularly from international strategy researchers. By presenting this issue in a new integrative framework of well-established economic and strategy theories such as resource-based, agency, and transaction costs theories, it is hoped that our paper will stimulate more diverse efforts in studying this strategic issue, which could potentially enrich the (theoretical) development of human resource management of multinational firms.
# TABLE 1 MEANS, STANDARD DEVIATIONS, AND CORRELATIONS

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consumer</td>
<td>4.165</td>
<td>6.075</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. LIT</td>
<td>0.390</td>
<td>0.234</td>
<td>0.0376</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. IIT</td>
<td>0.709</td>
<td>0.229</td>
<td>0.0814</td>
<td>1.0653</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Uncertain</td>
<td>0.001</td>
<td>0.001</td>
<td>0.062</td>
<td>0.4273</td>
<td>0.0263</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Multi</td>
<td>6.940</td>
<td>4.200</td>
<td>0.0242</td>
<td>0.1533</td>
<td>0.1045</td>
<td>0.1235</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Tacit</td>
<td>27.234</td>
<td>2.322</td>
<td>0.1689</td>
<td>0.1635</td>
<td>-0.1146</td>
<td>-0.0786</td>
<td>-0.0089</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Tacit-process</td>
<td>13.925</td>
<td>1.248</td>
<td>0.0343</td>
<td>0.1556</td>
<td>-0.0172</td>
<td>-0.0023</td>
<td>0.004</td>
<td>0.7943</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Tacit-product</td>
<td>13.309</td>
<td>1.532</td>
<td>0.2281</td>
<td>0.1211</td>
<td>-0.1598</td>
<td>-0.1172</td>
<td>-0.0168</td>
<td>0.8689</td>
<td>0.3894</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. R&amp;D</td>
<td>3.276</td>
<td>2.563</td>
<td>-0.0475</td>
<td>0.1574</td>
<td>0.1567</td>
<td>0.0965</td>
<td>0.1938</td>
<td>-0.1211</td>
<td>-0.0235</td>
<td>-0.1644</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. ADV</td>
<td>0.739</td>
<td>1.552</td>
<td>-0.1345</td>
<td>-0.1674</td>
<td>-0.0848</td>
<td>-0.0842</td>
<td>-0.0533</td>
<td>-0.1068</td>
<td>-0.0754</td>
<td>-0.1005</td>
<td>0.1349</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. ACQ</td>
<td>0.301</td>
<td>0.459</td>
<td>-0.0721</td>
<td>-0.0266</td>
<td>-0.0992</td>
<td>0.1218</td>
<td>-0.0504</td>
<td>-0.0829</td>
<td>0.0153</td>
<td>-0.1381</td>
<td>0.004</td>
<td>0.1128</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Age</td>
<td>13.4</td>
<td>5.455</td>
<td>-0.1549</td>
<td>0.089</td>
<td>-0.1656</td>
<td>0.0379</td>
<td>0.0025</td>
<td>0.0262</td>
<td>0.0735</td>
<td>-0.0202</td>
<td>-0.023</td>
<td>-0.0302</td>
<td>0.1074</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Subsize</td>
<td>746.0</td>
<td>3213.6</td>
<td>0.0357</td>
<td>-0.0049</td>
<td>0.0216</td>
<td>-0.0301</td>
<td>0.078</td>
<td>-0.0152</td>
<td>-0.0209</td>
<td>-0.006</td>
<td>-0.0086</td>
<td>-0.0203</td>
<td>-0.0126</td>
<td>0.0052</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Expat</td>
<td>9.425</td>
<td>13.828</td>
<td>0.0244</td>
<td>0.1807</td>
<td>0.0276</td>
<td>0.0793</td>
<td>0.2993</td>
<td>0.0444</td>
<td>0.0787</td>
<td>0.0031</td>
<td>0.1343</td>
<td>-0.0238</td>
<td>-0.2001</td>
<td>0.1848</td>
<td>0.0516</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15. JPN</td>
<td>0.664</td>
<td>0.473</td>
<td>-0.0266</td>
<td>0.026</td>
<td>0.0965</td>
<td>-0.1213</td>
<td>0.0412</td>
<td>0.0525</td>
<td>0.0015</td>
<td>0.0781</td>
<td>-0.0285</td>
<td>0.0254</td>
<td>-0.2493</td>
<td>0.051</td>
<td>-0.0504</td>
<td>0.1938</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONSUMER</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIT</td>
<td>6.28**</td>
<td>6.08**</td>
<td>6.68**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.12)</td>
<td>(3.08)</td>
<td>(3.10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIT</td>
<td>-0.22</td>
<td>-0.48</td>
<td></td>
<td>-0.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.86)</td>
<td>(2.83)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNCERTAIN</td>
<td>323.30</td>
<td>798.60*</td>
<td>327.61</td>
<td>772.42*</td>
<td>266.71</td>
<td>777.28*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(552.03)</td>
<td>(501.98)</td>
<td>(545.58)</td>
<td>(499.76)</td>
<td>(554.32)</td>
<td>(504.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MULTI</td>
<td>0.56****</td>
<td>0.59*****</td>
<td>0.56****</td>
<td>0.59****</td>
<td>0.56****</td>
<td>0.59****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TACIT</td>
<td>0.12</td>
<td>0.24</td>
<td></td>
<td></td>
<td>-0.08</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.51)</td>
<td>(0.51)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TACIT-PROCESS</td>
<td></td>
<td></td>
<td>0.49</td>
<td></td>
<td>-0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.51)</td>
<td></td>
<td></td>
<td>(0.44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TACIT-PRODUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>0.34*</td>
<td>0.43**</td>
<td>0.34*</td>
<td>0.42*</td>
<td>0.32</td>
<td>0.42*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADV</td>
<td>0.52</td>
<td>0.40</td>
<td>0.52</td>
<td>0.40</td>
<td>0.51</td>
<td>0.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.42)</td>
<td>(0.42)</td>
<td>(0.42)</td>
<td>(0.42)</td>
<td>(0.42)</td>
<td>(0.42)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACQ</td>
<td>-6.98****</td>
<td>-7.16****</td>
<td>-7.04****</td>
<td>-7.27****</td>
<td>-7.03****</td>
<td>-7.21****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.41)</td>
<td>(1.42)</td>
<td>(1.41)</td>
<td>(1.41)</td>
<td>(1.41)</td>
<td>(1.43)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>4.52****</td>
<td>4.66****</td>
<td>4.46****</td>
<td>4.56****</td>
<td>4.52****</td>
<td>4.68****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.35)</td>
<td>(1.37)</td>
<td>(1.35)</td>
<td>(1.37)</td>
<td>(1.35)</td>
<td>(1.37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUBSIZE</td>
<td>3.52****</td>
<td>3.52****</td>
<td>3.51****</td>
<td>3.50****</td>
<td>3.52****</td>
<td>3.53****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.52)</td>
<td>(0.53)</td>
<td>(0.52)</td>
<td>(0.53)</td>
<td>(0.52)</td>
<td>(0.53)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONSTANT</td>
<td>-30.49****</td>
<td>-32.43****</td>
<td>-33.74****</td>
<td>-34.34****</td>
<td>-26.29****</td>
<td>-27.13****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.71)</td>
<td>(9.28)</td>
<td>(7.95)</td>
<td>(8.31)</td>
<td>(7.36)</td>
<td>(8.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJ R-SQUARED</td>
<td>0.26</td>
<td>0.25</td>
<td>0.26</td>
<td>0.25</td>
<td>0.26</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.1 **p<0.05 ***p<0.01 ****p<0.005 (two-tailed)
<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSUMER</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>LIT</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.59)</td>
<td></td>
</tr>
<tr>
<td>IIT</td>
<td></td>
<td>0.98**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.53)</td>
</tr>
<tr>
<td>UNCERTAIN</td>
<td>-211.52**</td>
<td>-155.45**</td>
</tr>
<tr>
<td></td>
<td>(103.70)</td>
<td>(91.03)</td>
</tr>
<tr>
<td>MULTI</td>
<td>0.05*</td>
<td>0.05*</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>TACIT</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>ADV</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>ACQ</td>
<td>-1.13****</td>
<td>-1.12****</td>
</tr>
<tr>
<td></td>
<td>(0.25)</td>
<td>(0.26)</td>
</tr>
<tr>
<td>AGE</td>
<td>0.46**</td>
<td>0.53**</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>SUBSIZE</td>
<td>-0.21**</td>
<td>-0.20**</td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>0.30</td>
<td>-1.04</td>
</tr>
<tr>
<td></td>
<td>(1.66)</td>
<td>(1.73)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>357</td>
<td>357</td>
</tr>
<tr>
<td>LR Chi-squared</td>
<td>35.38</td>
<td>37.35</td>
</tr>
<tr>
<td>Pseudo R2</td>
<td>0.08</td>
<td>0.08</td>
</tr>
</tbody>
</table>

*p<0.1 **p<0.05 ***p<0.01 ****p<0.005 (two-tailed)
REFERENCES


