We examine the link between international diversification, organizational knowledge resources, and subsidiary performance. The success of international corporate diversification depends on a firm's capability to transfer knowledge to its subsidiaries, and how its local subsidiaries effectively utilize that knowledge. As knowledge resources are imperfectly mobile, a firm may find it difficult to transfer knowledge to its subsidiaries. In our analysis of 4964 Japanese subsidiaries over a 14-year period, we find that knowledge that is valuable, but not rare, positively affects subsidiary performance in the short term, but not the long term. In contrast, knowledge that is both valuable and rare affects subsidiary performance in the long term, but not the short term.

Keywords: resource-based view; knowledge transfer; international diversification; subsidiary performance; Japanese foreign direct investment; intangible assets

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According to the resource-based view of the firm (RBV), firms choose to diversify to extend their resources to new markets. Careful scrutiny of the RBV, however, uncovers a paradox with respect to diversification (Kogut and Zander, 1992, 1993). A resource must be both rare and valuable to lead a firm to a position of competitive advantage. If the advantage is to be sustained over time, that rare and valuable resource must resist transfer, substitution, and imitation (Barney, 1991). Yet, successful long-term diversification relies on the transfer of valuable and rare resources, like knowledge, between the subsidiaries of a firm. If this resource transfer did not occur, then the parent firm and its subsidiaries would be nothing more than standalone entities—the whole would not be more than the sum of its parts.

Hence, we are left with a paradox. The resources that provide the most benefit to a diversified firm are those that are the most difficult to transfer between diversification partners (Knott, 2003). Research to date has not adequately addressed this paradox (King and Zeithaml, 2001). Managers may assume that resources can be transferred with relative ease between parts of a diversified firm, but this might not always be the case (Simonin, 1999; Miller, 2003; Szulanski and Jensen, 2006). In fact, a firm may fail to effectively transfer its resources,
leading to lower than expected subsidiary performance, at least in the short term. We explore these issues by drawing on 14 years of panel data to examine the performance-related implications of four types of knowledge transfer between parent firms and their foreign subsidiaries.

BACKGROUND

Dunning (1993) recognized knowledge as a critical organizational resource. Likewise, the RBV makes the point that firms can be considered as distributed knowledge systems (Tsoukas, 1996). Knowledge is normally valuable and often rare. Proprietary knowledge is rare by definition and may be highly valued. As a consequence, knowledge is often a source of competitive advantage (Tsai, 2001). Knowledge that is a source of advantage resists imitation and substitution, but due to its inherent tacit nature it is hard to transfer. Thus, the capability to both identify and apply organizational knowledge within a firm may be a primary source of gaining and sustaining competitive advantage (Grant, 1991). For a multinational firm to take full advantage of international diversification, it must transfer its rare and valuable knowledge between the parent and subsidiary without making that knowledge simultaneously available to competitors (Kogut and Zander, 1993).

Empirical evidence suggests that in some instances multinational firms have successfully applied productive resources, particularly core knowledge resources, into new businesses (Chatterjee and Wernerfelt, 1991). These resources, such as marketing skills (Song et al., 2005), technological knowledge (Chatterjee and Wernerfelt, 1991), internationalization experience, and host country experience (Lu and Beamish, 2001; Makino and Delios, 1996) can be transferred between parents and subsidiaries, to aid the competitiveness and performance of a subsidiary. That said, empirical work has yet to identity the differential effects that these knowledge resources can have on a subsidiary’s performance.

Drawing such a distinction between knowledge resources is important given that knowledge has multiple attributes. The RBV supports this contention as it specifies the type of resource attributes that reflect a resource’s ability to create and sustain a competitive advantage (Barney, 1991). Knowledge-based resources vary in how rare and valuable they are. They also vary in the extent to which they can be transferred, imitated, or substituted (Tsoukas, 1996). A basic tenet of the RBV is that knowledge that is rare, valuable, and difficult to imitate and substitute confers a sustainable competitive advantage (Peteraf, 1993). Yet, such knowledge resources are also difficult to transfer within and across firms, creating the paradox of value and challenges to transferability (Kogut and Zander, 1993).

HYPOTHESES

To explore this paradox in resource value and mobility, we look at the influence of knowledge resources on subsidiary performance. We use this context as a subsidiary often relies for its competitiveness on knowledge resources developed elsewhere in the firm (Birkinshaw and Hood, 1998).

We begin our hypothesis development by identifying four knowledge resources that affect the success of international diversification efforts: internationalization experience, host country experience, technological knowledge, and marketing knowledge (Chatterjee and Wernerfelt, 1991; Lu and Beamish, 2001; Makino and Delios, 1996). We meld the identification of the four types of resources with core ideas from the RBV about how knowledge resources vary in the extent to which they embody the resource attributes of value, rarity, imitability, and substitutability (Barney, 1991).

The first two of these knowledge resources, internationalization experience and host country experience, are built by firms during the process of geographical diversification. Internationalization experience is a function of the extent to which a firm has operated in international markets previously (Lu and Beamish, 2001). Firms that have accumulated extensive international experience have general knowledge about operating in international environments. This form of knowledge can contribute to the understanding of a specific dimension of an institutional environment, such as culture (Barkema, Bell, and Pennings 1996), and it can contribute to the development of procedural knowledge about international operations that can be applied to current and new businesses (Eriksson et al., 2000). Although this experiential learning can be beneficial, it is not without its inherent challenges. The international experiential learning process involves both time
and effort (Barkema and Vermeulen, 1998). Once internalized within a firm, diverse country experiences lead to a fairly generalizable knowledge asset (Erramilli, 1991; Barkema et al., 1996).

Internationalization experience can be valuable, as it contributes to a firm’s capabilities to manage international operations (Eriksson et al., 2000), select among diverse market opportunities (Johanson and Vahlne, 1977), and operate in new international markets with similar institutional configurations as encountered in the past (Delios and Henisz, 2003). That said, international experience is not rare—it can be developed and possessed by other multinational firms. Further, it has substitutes as there are multiple paths to the accumulation of international experience. Given its value, but lack of rarity or substitutability, internationalization experience is a knowledge capability that subsidiaries can use to create a competitive advantage compared to foreign subsidiaries of parents without this knowledge, but it may be of limited use in sustaining that advantage beyond the short term.

**Hypothesis 1:** A subsidiary’s short-term performance will be positively associated with its parent’s internationalization experience.

Even firms with international experience can encounter location-based disadvantages (Makino and Delios, 1996). These disadvantages are derived from a lack of local knowledge of social, political, and economic conditions in the host country, as well as a lack of information on how to access the local labor force, distribution channels, raw materials, and other factors required for conducting business in the host country. Local host country experience is the extent to which the firm has operated in the local country environment. Multi-national firms resolve local knowledge disadvantages by accumulating local host country experience (Johanson and Vahlne, 1977; Li, 1994), hiring local staff (Beamish and Inkpen, 1998; Delios and Bjorkman, 2000), and increasing local ownership (Makino and Delios, 1996).

Local host country experience is valuable to a multinational firm, but like internationalization experience it is unlikely to be rare as there are a number of ways that firms can gain this knowledge. The accumulation of host country experience requires time, but it can be imitated, such as by a foreign firm’s joint venture with a local partner. According to resource-based logic, subsidiaries may benefit from their local knowledge initially, as it permits them to ameliorate disadvantages vis-à-vis local firms, but a multinational firm can not achieve a long-term, sustainable advantage based on these benefits.

**Hypothesis 2:** A subsidiary’s short-term performance will be positively associated with its parent’s host-country experience.

The third and fourth knowledge capabilities—technological knowledge and marketing knowledge—are built by firms through investments in R&D and brand building. Technological knowledge is a function of the proprietary technological knowledge-generating activities within a firm (Chatterjee and Wernerfelt, 1991; Song et al., 2005). Technological knowledge provides a firm with advantages in its international expansion activities (Caves, 1996; Cantwell and Mudambi, 2005), particularly compared with firms that do not possess equivalent levels of technological knowledge. Technological knowledge resident within a firm can pass across geographic boundaries, but still faces challenges to within-firm and between-firm transfer, with between-firm transfer being particularly difficult (Teece, 1987; Mitchell, 1994). Consequently, firms tend to use joint ventures (Kogut and Chang, 1991) and acquisitions (Frost, 1998) to transfer, augment, and build technological knowledge. Subsidiaries established in a host country tend to rely upon technological knowledge developed in the home country of the firm, as it resides in the parent (Birkinshaw and Hood, 1998).

The difficulty of technological knowledge transfer between firms enhances its proprietary nature. Whether it is protected by patents or by causal ambiguity, technological knowledge can be difficult to substitute and imitate. However, following the paradox of resource mobility, firms can encounter difficulties in transferring technological knowledge to subsidiaries. Firms that do manage to successfully transfer technological resources to subsidiaries, however, will enjoy sustained competitive gains.

**Hypothesis 3:** A subsidiary’s long-term performance will be positively associated with its parent’s level of technological knowledge.

Marketing knowledge is the capability to analyze markets, build and maintain brands, and develop
plans to sell products and/or services. Marketing knowledge may be rare, but its value depends on the context; that is, it may be location specific. Marketing knowledge is often used to build brands. Brands are rare and difficult-to-imitate resources in a firm because a brand is built in a series of cumulative investments in marketing over time (Kor and Mahoney, 2005). A firm’s brand can lead to a sustainable competitive advantage because it is a rare and valuable resource (Capron and Hulland, 1999). The brand’s value can be transferable, when it is applied to new products or new product categories (Park and Srinivasan, 1994), but the transfer of its value across borders can be challenging because of the time-consuming nature of brand building in new geographic markets (Katsikeas, Samiee, and Theodosiou, 2006). The difficulty of transfer often gives rise to the motivation to enter a new international market not with an existing brand, but through the acquisition of a host country incumbent’s marketing knowledge and brand assets (Capron and Hulland, 1999).

Even in the case where a firm can transfer its marketing knowledge and brands internally to a foreign subsidiary, differences in consumer markets and consumer knowledge across countries, along with other sources of institutional variation, diminish the value of a home country-based brand asset. The consequence of this is that advertising-based assets that are built on marketing knowledge accumulated in a firm’s home country might be less valuable, at least initially, in a foreign expansion, than experiential knowledge or technological knowledge (Anand and Singh, 1997). However, the value of a brand is likely to increase over time.

Differences in host countries often require a firm to adapt its marketing knowledge to its new country settings (Delios and Beamish, 2001). Provided a firm possesses marketing capability, which in itself can be a rare but internally transferable resource (Day, 1994), it can adapt its relatively immobile marketing-related resources, such as brands, to its new geographic markets (Capron and Hulland, 1999). The greater the adaptation that takes place, the more likely the marketing knowledge will positively contribute to a subsidiary’s performance in the host country (Anand and Delios, 2002). Local market adaptation is facilitated by host country and internationalization experience (Delios and Beamish, 2001).

Hypothesis 4: A subsidiary’s long-term performance will be positively associated with its parent’s level of marketing knowledge.

Hypothesis 5a: The greater the level of local host country experience, the stronger the positive relationship between a parent firm’s level of marketing knowledge and its subsidiary’s long-term performance.

Hypothesis 5b: The greater the level of international experience, the stronger the positive relationship between a parent firm’s level of marketing knowledge and its subsidiary’s long-term performance.

METHODOLOGY

Sample and data
We utilized the international corporate diversification of Japanese firms as the setting for our empirical analyses for three reasons. First, Japan is a leading source of foreign direct investment (FDI) worldwide. Second, most corporate diversification and knowledge transfer research has been focused on large multinational firms in North America and Western Europe (Dyer and Hatch, 2006; Grant and Jammie, 1988; Markides and Williamson, 1996). Less research has been conducted on corporate diversification outside these two regions (Guillen, 2000). Third, Japanese firms approach foreign markets incrementally with later investments exploiting capabilities built by earlier investments (Berry, 2006). Hence, Japanese firms are likely to build on previously accumulated international and host country experience, when establishing their new foreign subsidiaries. This investment path behavior provides a good setting in which to test hypotheses about the incremental transfer of knowledge capabilities between a parent and its subsidiaries.

We developed the sample from publicly listed firms found in the Nikkei NEEDS tapes as matched to information on foreign subsidiaries, as sourced from multiple annual editions of Kaigai Shinshutsu Kigyou Souran, Kuni-Betsu (Japanese Overseas Investments, by Country), a publication of Toyo Keizai Inc. The Nikkei NEEDS tapes provided annual information on the corporate parent. Japanese Overseas Investments was our source for data on foreign subsidiaries including...
performance, entry mode, size, industry, region, founding year, and host country and international experience. Before removing cases with missing values, we had information on more than 30,000 subsidiaries of more than 5000 parent firms, which is representative of the overall Japanese FDI landscape (Henisz and Delios, 2001).

To examine the influence of knowledge capabilities on subsidiary performance in both the short term and the long term, we used a 14-year time series (1990–2003). We adopted this time window because it can take at least 10 years for a Japanese subsidiary to realize a return (Tachiki, 1999). To avoid temporal biases associated with any single year, we included subsidiaries that were founded in 1990, 1991, and 1992 in the sample. After removal of cases with missing values, our sample comprised 4964 subsidiaries.

Measures

Due to the absence of financial performance data reported at the subsidiary level, we utilized a subjective measure of subsidiary performance. We drew this performance measure from Japanese Overseas Investments. Toyo Keizai developed this measure by surveying a subsidiary’s general manager to classify the financial performance of their subsidiary into one of three categories: loss, break-even, or gain. Delios and Beamish (2001) and Isobe, Makino, and Montgomery (2000) have demonstrated the content validity of this measure. Considering that subsidiary performance is unstable for the first 2 years following inception (Wade and Gravill, 2003), we used profitability in 1994 as our short-term measure of performance. We measured long-term performance using subsidiary profitability in 1999, 2001, and 2003.

We measured parent firm host country experience and parent firm internationalization experience, respectively, using a logarithmic transformation of the number of years of investment history the parent firm had in the host country, and a logarithmic transformation of the number of years of international investment history a firm had accumulated (Delios and Beamish, 2001). We measured technological knowledge and marketing knowledge using a parent firm’s R&D intensity and advertising intensity, respectively. R&D intensity is a key component and widely used proxy for technological knowledge (Beamish and Delios, 1999; Stimpert and Duhaime, 1997; Zahra and George, 2002). We used a 5-year average of R&D intensity, as lagged by the 5 years preceding the year in which we measured a subsidiary’s performance. Advertising intensity is a common measure of a firm’s brand equity and marketing knowledge (Anand and Singh, 1997). We used the same operationalization of advertising intensity as for R&D intensity (Delios and Beamish, 2001).

Our control measures included subsidiary size, defined as the log of the number of employees in a subsidiary, subsidiary age, entry mode, broad industry category of the subsidiary (tertiary industry or not) and region of host country (Asia, Europe, America, and other regions) (Dunning, 1993; Tallman and Li, 1996). We used ordered logistic regression to test our hypotheses as this is an appropriate quantitative choice procedure when the dependent variable is ordinal but not ratio scaled (Amemiya, 1981).

RESULTS

Table 1 presents the correlation matrix for all variables. Host country experience and internationalization experience were moderately correlated \((r = 0.606)\). Low correlation values across the other independent variables suggest that multicollinearity did not threaten the stability of the results.

Table 2 presents the results of our hypothesis tests. Model 1 reports the profitability analysis for 1994 (short-term performance). Models 2 (1999), 3 (2001), and 4 (2003) report the profitability analysis for long-term performance. For all models, we report results inclusive of main effects only, then inclusive of interaction terms, to indicate the robustness of coefficient estimates to the inclusion or exclusion of the interaction terms.

Hypothesis 1 stated our prediction that a subsidiary’s short-term performance is positively associated with its parent’s internationalization experience. The positive and significant coefficient \((p < 0.10)\) on the internationalization experience measure in Model 1 supports this hypothesis, indicating that in the short term subsidiary profitability was positively associated with a parent firm’s internationalization experience. In Models 2, 3, and 4 the estimated coefficients on internationalization experience were not significant, indicating there is no association between performance and internationalization experience in the long term.
Table 1. Correlations, means, and standard deviations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</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>
</tr>
</thead>
<tbody>
<tr>
<td>1. Founding year</td>
<td>1991</td>
<td>0.82</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Entry mode</td>
<td>1.74</td>
<td>0.86</td>
<td>-0.02</td>
<td>1</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>3. Subsidiary size</td>
<td>3.84</td>
<td>1.89</td>
<td>-0.01</td>
<td>0.29</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Parent size</td>
<td>3.50</td>
<td>0.55</td>
<td>-0.04</td>
<td>-0.01</td>
<td>0.13</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Industry</td>
<td>0.60</td>
<td>0.49</td>
<td>-0.03</td>
<td>-0.25</td>
<td>-0.57</td>
<td>0.02</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>6. Region</td>
<td>2.03</td>
<td>1.02</td>
<td>-0.06</td>
<td>-0.08</td>
<td>-0.24</td>
<td>0.07</td>
<td>0.24</td>
<td>1</td>
<td></td>
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<tr>
<td>7. Host country experience</td>
<td>3.79</td>
<td>1.31</td>
<td>-0.06</td>
<td>0.09</td>
<td>0.11</td>
<td>0.27</td>
<td>-0.06</td>
<td>-0.10</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. International experience</td>
<td>6.05</td>
<td>1.80</td>
<td>0.02</td>
<td>0.08</td>
<td>0.12</td>
<td>0.48</td>
<td>-0.02</td>
<td>0.07</td>
<td>0.61</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9. Marketing knowledge</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.02</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.13</td>
<td>-0.12</td>
<td>1</td>
</tr>
<tr>
<td>10. Technological knowledge</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.02</td>
<td>-0.06</td>
<td>0.01</td>
<td>0.28</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.01</td>
<td>0.08</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Correlations greater than 0.05 or less than −0.05 are significant at the 0.05 level; founding year: 1990, 1991, 1992; entry mode: JV = 1; WOE = 2; Region: Asia = 1; Europe = 2; North America = 3; Industry: non-tertiary = 0; tertiary = 1.

Hypothesis 2 stated our prediction that a subsidiary’s short-term performance is positively associated with its parent’s host country experience. The coefficient of host country experience in Model 1 was positive and significant \((p < 0.05)\), but it had no significant effect on profitability in Models 2, 3, or 4. Hence, host country experience exerts a positive short-term effect on subsidiary performance, but has no effect in the long term.

In Hypothesis 3, we predicted that a subsidiary’s long-term performance would be positively associated with its parent’s technological knowledge. The positive and significant coefficients of technological knowledge in Models 2, 3, and 4 \((p < 0.05)\) support this hypothesis. Unexpectedly, technological knowledge also had a significant, positive effect on subsidiary performance in the short term. This result runs counter to the paradox of resource mobility, and suggests that in particular instances parent firms were able to effectively transfer valuable, rare, and hard-to-imitate knowledge resources to subsidiaries in a short period of time.

In Hypothesis 4, we predicted that a subsidiary’s long-term performance is positively associated with its parent’s marketing knowledge. The coefficient of marketing knowledge was not significant in Models 1 and 2, but it was significant in Models 3 \((p < 0.10)\) and 4 \((p < 0.05)\). These results support Hypothesis 4, as subsidiary short-term performance was not associated with a parent’s marketing knowledge, but its long-term performance was.

In Hypothesis 5, we predicted that local country experience (Hypothesis 5a) and internationalization experience (Hypothesis 5b) would positively moderate the relationship between marketing knowledge and subsidiary performance. We used the interaction term between host country experience and marketing knowledge to test Hypothesis 5a. This interaction term was significant in both Models 3 and 4. This result, as illustrated in Figure 1, shows that a parent firm’s marketing knowledge had a stronger positive effect on subsidiary profitability, the greater the level of its host country experience. By contrast, the interaction term between internationalization experience and marketing knowledge was significant in Model 2, but not significant in Models 3 and 4. Overall, Hypothesis 5a was supported but Hypothesis 5b was not, demonstrating that host country experience provided the opportunity to adapt a firm’s marketing knowledge and assets to the host country, but international experience did not.

DISCUSSION

In our study, we paint a complex yet compelling picture of how knowledge capabilities affect subsidiary performance in firms pursuing an international diversification strategy. Our results and arguments support the point that not all knowledge is equal. Knowledge of varying types with differing characteristics along the RBV dimensions of rareness, value, imitability, and non-substitutability differentially affect a firm’s performance in the short and long term.

The results of our study support the basic tenets of RBV. Yet, in this support we reveal a paradox of resource mobility that can act as a real impediment to the transfer of complex capabilities, such as knowledge, within diversified firms.
Table 2. Ordered logistic regression for subsidiary profitability

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<tbody>
<tr>
<td></td>
<td>Main effects</td>
<td>With interaction terms</td>
<td>Main effects</td>
<td>With interaction terms</td>
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<tr>
<td></td>
<td>only</td>
<td></td>
<td>only</td>
<td></td>
</tr>
<tr>
<td>Knowledge capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 International Experience</td>
<td>0.07†</td>
<td>0.07†</td>
<td>0.012</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>H2 Host country experience</td>
<td>0.11*</td>
<td>0.12*</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>H3 Technological knowledge</td>
<td>4.79*</td>
<td>4.75*</td>
<td>4.91</td>
<td>4.92*</td>
</tr>
<tr>
<td></td>
<td>(2.40)</td>
<td>(2.39)</td>
<td>(2.02)</td>
<td>(2.01)</td>
</tr>
<tr>
<td>H4 Marketing knowledge</td>
<td>3.27</td>
<td>3.27</td>
<td>2.58</td>
<td>2.63</td>
</tr>
<tr>
<td></td>
<td>(3.99)</td>
<td>(4.13)</td>
<td>(3.52)</td>
<td>(3.64)</td>
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<tr>
<td>H5a Host country experience × Marketing knowledge</td>
<td>2.93</td>
<td>2.05</td>
<td>3.94</td>
<td>3.24*</td>
</tr>
<tr>
<td></td>
<td>(3.35)</td>
<td>(3.36)</td>
<td>(2.01)</td>
<td>(1.13)</td>
</tr>
<tr>
<td>H5b International experience × Marketing knowledge</td>
<td>−0.40</td>
<td>3.89†</td>
<td>0.36</td>
<td>−1.30</td>
</tr>
<tr>
<td></td>
<td>(2.93)</td>
<td>(2.28)</td>
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<td>(2.60)</td>
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<tr>
<td>Organizational character</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidiary size</td>
<td>0.08*</td>
<td>0.08*</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Parent size</td>
<td>0.94***</td>
<td>0.95***</td>
<td>0.88***</td>
<td>0.88***</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.014)</td>
<td>(0.10)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Founding year = 1990</td>
<td>0.80***</td>
<td>0.81***</td>
<td>0.23*</td>
<td>0.20†</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.15)</td>
<td>(0.11)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Founding year = 1991</td>
<td>0.60***</td>
<td>0.60***</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.13)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Entry mode = JV</td>
<td>0.05</td>
<td>0.05</td>
<td>−0.39†</td>
<td>−0.39†</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.22)</td>
<td>(0.21)</td>
<td>(0.21)</td>
</tr>
<tr>
<td>Entry mode = WOE</td>
<td>−0.10</td>
<td>−0.09</td>
<td>−0.12</td>
<td>−0.12</td>
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<tr>
<td></td>
<td>(0.22)</td>
<td>(0.22)</td>
<td>(0.20)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>Industry</td>
<td>−0.03</td>
<td>−0.04</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.14)</td>
<td>(0.13)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Region</td>
<td>−0.10†</td>
<td>−0.10†</td>
<td>−0.21***</td>
<td>−0.21***</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
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<tr>
<td>Log-likelihood</td>
<td>2935.7</td>
<td>2932.1</td>
<td>3611.4</td>
<td>3602.4</td>
</tr>
<tr>
<td>Model chi-square</td>
<td>163.3***</td>
<td>164.21***</td>
<td>218.31***</td>
<td>224.87***</td>
</tr>
<tr>
<td>Number of cases</td>
<td>1597</td>
<td>1597</td>
<td>1648</td>
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</table>

First number in a cell is a coefficient estimate; number in parentheses is the standard error of the estimate.  
† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001
Non-rare and fungible knowledge capabilities such as internationalization experience and host country experience positively influence performance in the short term, but not in the long term. Rare and less fungible knowledge capabilities, such as marketing knowledge, do not affect performance in the short term, but do so in the long term. Further, marketing knowledge is context specific. Even if it is transferred from a parent to a subsidiary, it must be modified at the subsidiary level to account for local factors. This modification, as shown in Figure 1, comes from the presence of a co-specialization factor, namely host country experience. A co-specialization factor acts as a catalyst for enabling resources that have slow-acting attributes to become valuable sources of advantage for a firm. The presence of one resource can thus enhance the value of another resource.

A firm’s technological knowledge positively influences subsidiary performance in both the short and long term. One explanation for this finding is that technological knowledge in the form of technical know-how is more context independent than marketing knowledge. Technological knowledge does not need to be modified to fit local country-specific conditions to the same extent as marketing knowledge, and thus the performance benefits for a subsidiary can be realized in a comparatively short time span. Our ex post test of the interaction between technological knowledge and host country experience showed no significant effect on subsidiary performance, thus empirically supporting this explanation.

Further to this point, some forms of technological knowledge, such as patents, are protected by legislation, which can provide the diversified firm with a concrete competitive advantage. Diversified firms can also contain mechanisms that facilitate the transfer of complex knowledge between a parent and its subsidiaries, such that they reduce internal barriers to knowledge transfer. As a consequence of these features, a parent firm’s technological knowledge can have a relatively short time span to successful transfer to a foreign subsidiary. Interestingly, this advantage endures, unlike experience-based knowledge, supporting the idea that technological knowledge can flow more easily within firm boundaries than across firm boundaries (Kogut and Zander 1992, 1993).

Our findings have implications for conceptual developments of the RBV within the context of diversified organizations. Figure 2 presents our conceptualization of the RBV as adapted from Mata, Fuerst, and Barney (1995). As shown in this figure, resources that are valuable, heterogeneous (rare), and imperfectly mobile across firms can lead a firm to a position of sustainable competitive advantage. However, as our results demonstrate, some knowledge resources will only contribute to improved performance after an extended period of time. Thus, a diversified firm might not see an immediate performance gain related to a corporate diversification effort, even when it possesses valuable, rare, and imperfectly mobile resources.

Technological knowledge challenges this paradox of resource mobility, as technological knowledge can support a rapid building of sustainable competitive advantage. Interestingly, if future research examines product diversification, we might find opposite results for marketing and technological resources. Marketing knowledge resources might have an immediate application in the same geographic setting, while technological knowledge resources might yet require time to be adapted for advantage in the new business line.

Implications for research and practice

There has been much conceptual work using the RBV, yet comparatively little empirical research (Wade and Hulland, 2004), particularly along the longitudinal dimension. Given that resources can
be viewed as strategic commitments over an extended period of time, longitudinal data are required to determine the ‘sustainability’ of competitive advantages (Kraatz and Zajac, 2001; Miller and Shamsie, 1996). We draw on data over a 14-year period to gain a robust picture of RBV-related influences on both short-term and long-term firm performance. In addition, few studies using the RBV have examined the applicability of resource attributes (value, rarity, imitability, non-substitutability), despite the fact that these attributes are central to RBV logic. This paper differentiates among four knowledge capabilities along the line of each capability’s resource attribute set.

The study provides qualified support for the RBV. We show that knowledge that is valuable, but not rare, can lead to a short-term but not long-term competitive advantage. Conversely, knowledge that is valuable, rare, and resistant to imitation and substitution can lead to a long-term competitive advantage. However, such knowledge may be difficult to transfer from parent to subsidiary in the short term. These results provide empirical support for the notion of a knowledge transfer paradox (Kogut and Zander, 1992, 1993; King and Zeithaml, 2001; Szulanski and Jensen, 2006).

The existence of a paradox of resource mobility has important implications for senior managers considering, or implementing, an international diversification strategy. A common justification for such a strategy is to leverage the parent’s firm-specific knowledge to improve subsidiary performance. This study highlights the challenges to the implementation of this strategic intent. The more complex a firm’s knowledge, the more difficult it will be to transfer effectively. Managers should not look to short-term performance when an expansion is predicated on the transfer of complex firm-specific knowledge. Managers with the patience to stick through short-term instability in international diversification may be rewarded by long-term gains (Lu and Beamish, 2004).

**Limitations**

This study has limitations inherent to the use of archival data. The content validity of measures requires better testing, and perhaps improved operationalization, which can be obtained through
collection of primary data (Capron and Hulland, 1999). The data, while generally supportive of the hypotheses, do not provide insight into process issues, in terms of how knowledge is effectively transferred across organizational units, given the differences in knowledge attributes that we have identified. In depth, qualitative analysis is required to more fully understand the how and why of knowledge transfer between parents and subsidiaries in international contexts. Part of the how relates to the knowledge flows and its directionality, in particular future empirical needs to address two of the assumptions in our research: whether the technological, marketing, and experiential knowledge flows actually took place, and whether the possession of these resources at the subsidiary level actually does enhance subsidiary performance. Another potential extension is to examine how the paradox on resource value and transferability manifests itself when transferred in different directions in geographically diversified firms.

This study examined the link between international diversification, organizational knowledge resources, and subsidiary performance. Our results suggest that knowledge capabilities that are valuable, but not rare, positively affect subsidiary performance in the short term but not the long term. In contrast, knowledge capabilities that are valuable, rare, and inimitable affect subsidiary performance in the long term but less so in the short term.

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REFERENCES


