RESEARCH NOTES AND COMMENTARIES

ENTRY MODE AND EQUITY LEVEL: A MULTILEVEL EXAMINATION OF FOREIGN DIRECT INVESTMENT OWNERSHIP STRUCTURE

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Over the last two decades, strategy researchers have sought to understand the ownership structure of firms’ foreign direct investments (FDI) as reflected in entry mode and equity level. However, prior FDI research has ignored the interrelated nature of these key FDI decisions. In addition, prior research does not fully account for the fact that individual ownership structure decisions occur within the context of a firm’s broader FDI portfolio, and thus reflect a wide and frequently unobserved range of parent firm and host nation effects. Our research seeks to address both of these limitations. Using a rich dataset of 4,459 subsidiaries established by 858 Japanese firms across 38 countries over a 9-year period, we specify a conditional bivariate, cross-classified multilevel model of FDI ownership structure. Our model enables the joint estimation of entry mode and equity level, accounts for the portfolio nature of FDI, and compares the relative predictive power of transaction cost- and experience-based explanatory variables across both facets of ownership structure. Copyright © 2007 John Wiley & Sons, Ltd.

Foreign direct investment (FDI) is a critical component of a firm’s strategic agenda and has been a topic of substantial interest among strategy scholars for over two decades (e.g., Anderson and Gatignon, 1986; Delios and Beamish, 1999a, 1999b; Kogut and Singh, 1988; Makino and Neupert, 2000). Entering a foreign market is an expensive, risky, and daunting task that comprises multiple decisions. Among the most important of these decisions is the ownership structure arrangement of a new subsidiary, as parent firms must select an appropriate mode of entry. For joint ventures, the entering firm must also decide upon its level of equity investment.1

These two decisions are strategically interrelated and represent complementary, but distinct, perspectives of FDI ownership structure. Specifically, mode of entry represents a dichotomous choice between full vs. partial ownership control

1 The level of equity decision is only relevant for firms that select a joint venture (JV). This implies that the equity level decision is contingent on the parent firm’s use of the JV mode. This contingent nature of equity level is often ignored in most FDI studies.

Keywords: foreign direct investment; transaction cost analysis; multilevel modeling

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of a subsidiary, while level of equity represents a continuous span of ownership control, from 0 to 100 percent. This distinction is subtle but important, as entry mode provides a macro perspective of the differences between sole vs. shared control but ignores possibly important differences between joint ventures with varying levels of equity control. In contrast, equity level provides a micro perspective of subtle differences in the level of shared control but does not fully capture the important strategic distinction between sole vs. joint ownership.

This distinction is clearly evident between two well-known Japanese multinational firms: Sony and Sharp. Across the wholly owned subsidiaries (WOS) and joint ventures (JVs) that comprise their FDI portfolios between the years 1992 and 2000, Sony and Sharp owned 92 percent and 79 percent of the equity in their foreign subsidiaries, respectively (Toyo Keizai 1992–2000). Thus, research that uses level of equity as its sole indicator would suggest that these two firms are broadly similar in terms of their ownership structure patterns. However, this suggestion would be misleading, as Sony displays a marked preference for WOS, as 74 percent of its subsidiaries employed this entry mode. In contrast, only 42 percent of the subsidiaries that Sharp established in this period employed WOS. Thus, to gain an enriched understanding of ownership structure, FDI scholars should assess both of these strategically interrelated ownership structure decisions. Most empirical FDI studies, however, focus solely on mode of foreign market entry (e.g., Chang and Rosenzweig, 2001; Kogut and Singh, 1988; Madhok, 1997), while a smaller set of studies examines the level of foreign market equity investment (e.g., Delios and Beamish, 1999b; Delios and Henisz, 2000; Pan and Li, 2000).

This is an important issue, as both streams of FDI research rely upon a common set of theoretical predictors, drawing upon transaction cost analysis (TCA) (e.g., Chang and Rosenzweig, 2001; Delios and Beamish, 1999b), and a more recent experience perspective (Delios and Henisz, 2000; Madhok, 1997).² According to TCA, firms seek to safeguard specific investments from opportunistic exchange partners by seeking greater levels of equity control (Williamson, 1985). Moreover, TCA also posits that this safeguarding need is heightened in uncertain environments. Thus, according to this perspective, parent firms with high levels of specific investments and operating in uncertain environments will seek ownership structures with high levels of equity control.

Although the TCA perspective has proven to be a useful framework for understanding ownership structure in general, FDI decisions are often part of a broader corporate strategy and are influenced by both prior investments and future plans. Thus, a number of recent studies have adopted a broader theoretical perspective that incorporates the strategic role of experience into FDI decision making (e.g., Chang, 1995; Madhok, 1997). The basic premise behind the experience perspective is that a parent firm’s prior foreign investments (in the form of a specific mode of entry, industry, or host nation) provide a source of learning and capability generation that influences its subsequent investment decisions.

The implicit assumption in FDI research is that TCA and experience predictors have similar influences upon both entry mode and equity investment decisions. However, studies that examine these ownership decisions in isolation may produce misleading inferences regarding the actual influence of these two theoretical perspectives due to the risk of inflated Type I error (Hox, 2002). Indeed, empirical research on the effects of TCA and experience of ownership structure is surprisingly mixed and lacking in consensus about the exact roles of these two sets of predictors. As a result, the relative contribution of the TCA and experience perspectives upon entry mode vs. level of equity remains unclear. We refer to this uncertainty surrounding the relative importance of these theoretical drivers as FDI’s ownership structure problem.

In addition to sharing a common set of theoretical drivers, both of these ownership structure decisions are also subject to the strategic preferences of the parent firm (Chang and Rosenzweig, 2001), as exemplified by Sony’s observed preference for WOS and high levels of equity ownership vs. Sharp’s preference for JVs across various levels of equity ownership. These parent firm preferences

² In addition to these two main viewpoints, a variety of other theoretical perspectives have been employed by FDI researchers, including institutional theory (e.g., Yiou and Makino, 2002), culture theory (e.g., Chang and Rosenzweig, 2001; Kogut and Singh, 1988), and evolutionary theory (e.g., Mutinelli and Piscitello, 1998), among others.
are also influenced by the idiosyncrasies of the nations hosting these subsidiaries (Gatignon and Anderson, 1988). Thus, in most cases, foreign subsidiary ownership structure choices differ significantly and systematically across firms as well as host nations.

Although prior FDI studies have identified several parent firm- and host nation-specific predictors of ownership structure (e.g., Barkema and Vermeulen, 1998; Delios and Beamish, 1999b; Delios and Henisz, 2000), they typically employ traditional fixed effects–regression approaches (e.g., logit and tobit) that are unable to account for the unobservable parent- and host nation-specific idiosyncrasies that persist among the multiple subsidiaries established by parent firms across diverse nations. Failure to account for this unobserved heterogeneity may result in omitted variables bias (Hsiao, 2003). We refer to the influence of these unobserved parent firm strategic preferences as FDI’s portfolio problem.

Our research seeks to address these two methodological limitations facing current FDI research. First, we acknowledge the related nature of FDI ownership structure decisions by specifying a conditional bivariate model that provides joint estimates for both entry mode and level of equity (Duncan, Jones, and Moon, 1996). Second, we account for the heterogeneity in FDI ownership structure as a function of unobserved parent firm- and host nation-related characteristics by employing a cross-classified multilevel specification (Hough, 2006). Thus, our investigation addresses Hough’s (2006: 60) recent call for ‘re-examination of the results in any area of strategy research based upon hierarchical data structures that has not explicitly modeled the inherent nesting of the data.’ In order to illustrate the theoretical and empirical advantages of our estimation technique, we compare our results against those that would have been obtained if we had employed traditional fixed-effect methods such as tobit and logit regression. This comparison reveals that our approach uncovers important distinctions in the theoretical drivers of entry mode vs. equity level that would have remained hidden by traditional approaches. Although our contribution is primarily methodological, we also seek to contribute to FDI theory by providing sharpened clarity on the relative influence of transaction cost and experience predictors on entry mode and equity level.

**RESEARCH DESIGN**

**Data**

The context for our inquiry is the FDI ownership structure decisions of Japanese parent firms. The core of our data is drawn from the *Toyo Keizai* directory, which is an annual compilation of the FDI activity (i.e., subsidiary entry mode and equity level) of major Japanese firms. We then matched this information with parent firm data (i.e., advertising expenditures, R&D investments, sales, number of employees) from the *Analyst’s Guide* and the *Kaisha Zaimu Karate*. This core set of data was then supplemented with information on host country investment conditions, gathered from the *World Competitiveness Report*, recorded annually since 1992.

We selected subsidiaries according to three criteria: First, these subsidiaries had to be established between 1992 and 2000. This time constraint corresponds to the years for which we had available data on subsidiary formation and host nation descriptors. We took care, however, to consider each parent firm’s entire history of FDI when deriving its experience measures. Second, selected subsidiaries had to be in the manufacturing, wholesale, or retail sectors. This constraint was imposed in order to allow for cross-sector variance while minimizing extraneous heterogeneity. Finally, we only included subsidiaries that employed JV or WOS mode of entry, as the literature on FDI ownership structure has focused largely on these two forms. More than 90 percent of the 4,904 subsidiaries established between 1992 and 2000 employed JV or WOS.

After removing observations for which firm- or nation-level data were not available, we were left with a sample comprising 4,459 subsidiaries (2,480 JVs and 1,979 WOS) established by 858 parent firms across 38 countries, from 1992 to 2000. Our sample represents 40 percent of the total number of Japanese subsidiaries established during this time frame. Consistent with prior work (e.g., Hennart, 1991; Makino and Neupert, 2000), we defined any subsidiary in which the parent firm controlled 95 percent or more of the equity as a WOS.3

3 Following Dhanaraj and Beamish (2004), we also tested an alternate model using 80 percent as the cut-off equity participation. This alternative specification has little effect on our results.
Measures

Transaction cost measures

Consistent with prior TCA-informed studies in the FDI literature, we assess specific asset safeguarding by focusing on parent firms’ efforts to protect their investments in new product development and branding (Delios and Henisz, 2000; Gatignon and Anderson, 1988; Osborn and Baughn, 1990). In line with this prior research, we utilize R&D intensity (the R&D-to-sales ratio averaged over the 5 years preceding the establishment of the particular subsidiary) and advertising intensity (the advertising-to-sales ratio, also averaged over the preceding 5 years) as measures of parent firms’ investments in new product development and branding, respectively. These data were obtained from the Analyst’s Guide.

Following Gatignon and Anderson (1988), we assessed uncertainty as host country risk using a six-item measure comprising indicators of judicial system efficiency, absence of bureaucratic corruption and red tape, intellectual property protection, anti-trust regulation, and the establishment of a stable political system (Delios and Henisz, 2000). Scores on each of these indicators are obtained from practicing managers in each host nation in response to annual surveys conducted by the World Economic Forum and IMD, and published in the World Competitiveness Report. Each item is rated on a 10-point scale (where 10 = high); this measure exhibited a high degree of internal consistency ($\alpha = 0.86$), and all six items loaded on a single factor with loadings greater than 0.75. As this measure displays acceptable psychometric properties, we used the derived factor score across these six items as our measure of country risk.

Experience Measures

We computed measures of host nation, industry (i.e., manufacturing, wholesale, or retail), and WOS experience by using the subsidiary-level information obtained from the Toyo Keizai directory. Although the subsidiaries we analyze were formed in 1992 or later, the directory contains information about the entry mode, equity level, host nation, and industry for parent firms’ subsidiaries dating back to 1914. For each of the 4,459 subsidiaries in our sample, we assessed the parent firm’s level of experience with the particular nation, industry, and with establishing WOS up to the year 2000. This was done by counting the number of prior subsidiaries established by that parent firm in that host nation, industry, or as WOS. To account for experience in a fine-grained manner, we weighted each prior instance of subsidiary formation using the product of the parent’s level of equity investment in that subsidiary and the number of years the subsidiary survived. We then summed this score across the parent’s prior FDI pattern to arrive at the parent firm’s experience at the time each subsidiary was established. Finally, we conducted a natural logarithmic transformation on this summed experience score, to reflect the notion that firms learn from their previous experience at a decreasing rate (Erramilli, 1991).

Control measures

We control for firm size and performance, as reflected by each parent firm’s number of employees and return on assets at the time of subsidiary formation. For those subsidiaries established as JVs, we also controlled for the number of other Japanese firms partnering with the focal firm. We also account for cross-sector differences (Padmanabhan and Cho, 1999) with wholesale- and retail-sector specific dummy variables contrasted with the base case of manufacturing. Finally, we included fixed effects for the year of establishment for each subsidiary in our dataset, using dummy variables for 8 of the 9 years of data, with 1992 as the base year.

Data structure and model

We model FDI ownership structure as a bivariate outcome set using a multilevel regression specification with entry mode choice and level of equity investment by the parent firm in a given foreign subsidiary as the dependent variables (Hox, 2002). Specifically, we represent $Y_{hij}$ as the response on outcome $h$ (entry mode or equity level) of subsidiary $i$ established by investing parent firm $j$, and define two dummy variables, one for each outcome variable, such that $d_{pij} = 1$ for $p = h$, and 0 otherwise, thus specifying the first equation of our multilevel model as

$$Y_{hij} = \pi_{1ij}d_{1ij} + \pi_{2ij}d_{2ij}$$

(1)

We then specify the $\pi_{p|ij}$ as random intercepts to allow for random variation at the subsidiary level.
such that \( \pi_{pij} = \beta_{pj} + u_{pij} \), and include parent firm random effects by specifying \( \beta_{pj} = \gamma_p + u_{pj} \). Substituting these expressions into Equation 1 above, we get

\[
Y_{hi(j2)} = \gamma_1 d_{1ij} + \gamma_2 d_{2ij} + u_{1ij} d_{1ij} + u_{2ij} d_{2ij}
\]

(2)

Two additional features of our data structure and model specification deserve mention, and entailed further modification of Equation 2. The first issue pertains to the conditional bivariate nature of our outcome variables. In contrast to the JV entry mode, wherein the focal firm’s equity investment may range from 0.05 to 0.95, the WOS entry mode implies full equity investment. The one-to-one mapping of the WOS entry mode and equity level result in an inflated and potentially misleading correlation between mode and equity. To address this issue, we adopt Duncan et al.’s (1996) recommended modification of the standard approach of bivariate multilevel model specification, modeling equity investment only for the cases where there was meaningful range on this variable (i.e., JVs; see Appendix). Specifically, we create pairs of pseudo-observations for the JV entry mode only (note the single outcome for the third subsidiary displayed in Figure A.1 and the single observation representing that outcome in Table A.2). In effect, we model equity investment only for the cases where there was meaningful range on this variable (i.e., JVs).

It is also important to note that each subsidiary is nested within, and uniquely identified by the parent firm investing in it and the nation hosting it (see Appendix). As such, subsidiaries are nested within a ‘cross-classification’ (XC) of parent firm and host nation (Hough, 2006). We therefore modify Equation 2 to model the XC nature of the data structure:

\[
Y_{hi(j1,j2)} = \gamma_1 d_{1ij(j1,j2)} + \gamma_2 d_{2ij(j1,j2)} + u_{1ij(j1,j2)} + u_{2ij(j1,j2)} + u_{1(j1,j2)} d_{1ij(j1,j2)} + u_{2(j1,j2)} d_{2ij(j1,j2)}
\]

(3)

where \( Y_{hi(j1,j2)} \) = response on outcome \( h \) for subsidiary \( i \), established in the \( j1 \)th nation by the \( j2 \)th parent firm; \( \gamma_p \) represent the subsidiary-, parent firm-, and subsidiary-specific fixed effects and their estimated coefficients, \( u_{h(i1,j1)} \) is the random effect for nation \( j1 \), \( u_{h(j2)} \) is the random effect for parent \( j2 \), and \( u_{h(i1,j1,j2)} \) is the residual for the \( i \)th subsidiary established in the \( j1 \)th nation by the \( j2 \)th parent firm.

Equation 3 represents a variance components (VC) model (see Raudenbush and Bryk, 2002), with three levels of specification: the bivariate outcome set at level 1, with individual subsidiaries at level 2, and a cross-classification of parent firm and host nation error terms at level 3. This VC model can be considered a useful baseline against which the fit of the full model may be assessed. We subsequently add our hypothesized predictors as fixed effects to this base model by multiplying each of the \( Z_i \) predictors by the \( h \) (two) dummy variables:

\[
Y_{hi(j1,j2)} = \sum_{h=1}^{2} \gamma_h d_{hi} + \sum_{h=1}^{2} u_{hi} d_{hi} + \sum_{h=1}^{2} \lambda_h Z_j d_{hi}
\]

(4)

To address the ownership structure problem, we included TCA and experience as separate predictors in the model, and WOS experience as a predictor of entry mode but not equity level. Finally, we included the control variables of firm size, parent ROA, and sector and year of subsidiary establishment as fixed effects constrained to equality across the bivariate outcome set. We also control for the number of partners involved in the JV for level of equity investment. We conducted logistic transformations on both dependent variables to account for the categorical and limited-range nature of the FDI ownership structure choices (Maddala, 1999), and estimated Equation 4 using iterative generalized least squares (IGLS). This algorithm cycles through multiple GLS estimates of the fixed effects by repeatedly regressing the cross-product matrix of their residuals on the dependent variables until convergence is attained (Goldstein, 2003).

**RESULTS AND DISCUSSION**

Our first model (i.e., the base model) jointly examines both entry mode and equity level and specifies both firm- and nation-specific variance components, as represented in Equation 3. Our second model (i.e., the full model) expands upon the base model, by incorporating the variance components as well as our measures of transaction...
cost, experience, and control variables, as represented in Equation 4, Table 1 presents the base and full models, followed by corresponding estimates obtained from separate fixed-effects regressions of entry mode (logit) and equity participation (tobit), traditionally employed by most FDI studies.

Base model
As suggested by Goldstein (2003), significant covariation in nation- and firm-specific components across entry mode and equity level would provide statistical support for our general modeling approach. Indeed, the random effects corresponding to the base model displayed in Table 1 indicate that entry mode and equity level exhibit significant covariation across both parent firms ($\sigma_{12(j2)} = 0.23$, $p < .001$) and host nations ($\sigma_{12(j1)} = 0.12$, $p < 0.05$). These results indicate a need to assess entry mode and equity level as strategically related forms of FDI ownership.

The base model in Table 1 also provides estimates of the level of parent firm- and nation-specific heterogeneity. We find evidence of significant host nation-specific variance with respect to both entry mode ($\sigma^2_{1(j1)} = 6.91$, $p < 0.001$) and equity participation ($\sigma^2_{2(j1)} = 0.003$, $p < 0.01$). Moreover, both of these decisions are also significantly impacted by unobserved parent firm-specific characteristics ($\sigma^2_{1(j2)} = 14.57$, $p < 0.001$; $\sigma^2_{2(j2)} = 0.033$, $p < 0.001$). On a percentage basis, both firm- and nation-specific heterogeneity explain a considerably higher amount of variance in mode of entry (firm = 24%, nation = 11%) compared to level of equity (firm = 15%, nation = 1%).4 These estimates support our claim that parent firms’ strategic preferences and host nation characteristics exert significant influence upon the ownership structure of a newly established subsidiary. However, these considerations matter more for mode of entry than for level of equity. Finally, as a benchmark for comparison with the full model, we observe that this base model had a log-likelihood statistic (i.e., goodness of fit) of 33,514.

Full model
As shown in the second column of Table 1, the log-likelihood statistic of the full model is significantly lower than that of the base model (33,233 vs. 33,514, $\chi^2 = 281$, d.f. = 28, $p < 0.001$), indicating its superiority over the earlier model. The standardized coefficients for the predictor variables provide a comparison of the relative impact of our TCA and experience predictors across entry mode and equity level. We denote the coefficients for entry mode and equity level with the subscripts $M$ (mode) and $E$ (equity).

Our results suggest that concerns about safeguarding specific investments in the form of brand name capital (i.e., advertising intensity) encourage Japanese parent firms to seek wholly owned subsidiaries ($b_{1M} = 38.77$, $p < 0.001$), as well as greater levels of equity investment when establishing a JV ($b_{1E} = 1.81$, $p < 0.05$). In contrast, investments in new products, as reflected in R&D intensity, have no significant impact on either aspect of FDI ownership structure ($b_{2M} = 9.95$, n.s.; $b_{2E} = 0.37$, n.s.). Our results also suggest that environmental uncertainty (in the form of country risk) does not moderate the influence of transaction-specific investments on either entry mode ($b_{4M} = 13.09$, n.s.; $b_{5M} = 7.53$, n.s.) or equity level ($b_{4E} = -0.67$, n.s.; $b_{5E} = -0.81$, n.s.). However, country risk does exhibit a strong direct influence ($b_{3M} = 1.28$, $p < 0.001$) upon the use of WOS as an entry mode. Note that a high score on country risk indicates low levels of uncertainty. This finding runs counter to traditional TCA, which suggests that firms will seek to manage the risks associated with operating in uncertain environments by obtaining higher levels of equity control (Williamson, 1985). However, this result is consistent with the experience perspective, which suggests that a turbulent and uncertain investment environment discourages greater control in the subsidiary (Delios and Henisz, 2000).

As noted earlier, our analysis included three specific indicants (i.e., WOS-, host nation-, and industry-specific facets) of the role of experience on FDI mode of entry and level of equity. Our results suggest that, as expected, experience with a WOS entry mode is positively related to the use of a WOS mode when establishing a new subsidiary ($b_{6M} = 0.42$, $p < 0.001$). Similarly, a

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4 Estimates of variance–covariance terms in the base model suggest that firm-specific variance with respect to entry mode = $\sigma^2_{1(j2)}/\{\sigma^2_{1(j1)} + \sigma^2_{2(j2)} + \sigma^2_{1(j1)j2}\} = [14.57/(6.91 + 14.57 + 40.29)] = 24$ percent. We obtained estimates of share of variance explained by nation in a similar manner.
Table 1. Model results

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Base model</th>
<th>Full model</th>
<th>Standard model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mode</td>
<td>Equity</td>
<td>Mode</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.330(0.478)</td>
<td>-0.697(0.016)**</td>
<td>-3.383(0.547)**</td>
</tr>
<tr>
<td>Fixed effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising intensity</td>
<td>38.770 (7.292)**</td>
<td></td>
<td>15.813 (2.81)**</td>
</tr>
<tr>
<td>R&amp;D intensity</td>
<td>9.597 (5.328)</td>
<td>0.378 (0.512)</td>
<td>5.139 (1.590)**</td>
</tr>
<tr>
<td>Country risk</td>
<td>1.283 (0.298)**</td>
<td>0.029 (0.020)</td>
<td>0.653 (0.041)**</td>
</tr>
<tr>
<td>Advertising intensity × Country risk</td>
<td>13.090 (6.909)</td>
<td>-0.669</td>
<td>12.754 (3.09)**</td>
</tr>
<tr>
<td>R&amp;D intensity × Country risk</td>
<td>7.534 (4.968)</td>
<td>-0.808</td>
<td>3.013 (1.52)**</td>
</tr>
<tr>
<td>WOS experience</td>
<td>0.423 (0.077)**</td>
<td></td>
<td>0.143 (0.026)**</td>
</tr>
<tr>
<td>Country experience</td>
<td>-0.774(0.010)**</td>
<td>-0.030(0.007)**</td>
<td>-0.156(0.025)**</td>
</tr>
<tr>
<td>Industry experience</td>
<td>0.199 (0.053)**</td>
<td>0.008 (0.004)*</td>
<td>0.051 (0.017)**</td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of partners</td>
<td>1.087 (0.313)**</td>
<td></td>
<td>4.260 (0.951)**</td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.015 (0.009)</td>
<td></td>
<td>-0.238(0.036)**</td>
</tr>
<tr>
<td>Wholesale sector</td>
<td>0.141 (0.024)**</td>
<td></td>
<td>0.904 (0.075)**</td>
</tr>
<tr>
<td>Retail sector</td>
<td>0.032 (0.060)</td>
<td></td>
<td>0.301 (0.213)</td>
</tr>
<tr>
<td>Founding year 1993</td>
<td>0.112 (0.04)**</td>
<td></td>
<td>0.057 (0.146)</td>
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<tr>
<td>Founding year 1994</td>
<td>0.155 (0.038)**</td>
<td></td>
<td>-0.001(0.147)</td>
</tr>
<tr>
<td>Founding year 1995</td>
<td>0.217 (0.036)**</td>
<td></td>
<td>0.178 (0.134)</td>
</tr>
<tr>
<td>Founding year 1996</td>
<td>0.165 (0.036)**</td>
<td></td>
<td>0.185 (0.135)</td>
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<tr>
<td>Founding year 1997</td>
<td>0.231 (0.039)**</td>
<td></td>
<td>0.476 (0.140)**</td>
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<tr>
<td>Founding year 1998</td>
<td>0.198 (0.044)**</td>
<td></td>
<td>0.521 (0.154)**</td>
</tr>
<tr>
<td>Founding year 1999</td>
<td>0.329 (0.055)**</td>
<td></td>
<td>0.577 (0.182)**</td>
</tr>
<tr>
<td>Founding year 2000</td>
<td>0.191 (0.059)**</td>
<td></td>
<td>0.851 (0.186)**</td>
</tr>
<tr>
<td>Random effects: variance–covariance components</td>
<td>6.910 (1.95)**</td>
<td>4.645 (1.383)**</td>
<td>0.003 (0.001)**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.012 (0.050)*</td>
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<td></td>
<td>0.145 (1.402)**</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>0.033 (0.006)**</td>
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<td></td>
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<td></td>
<td>0.231 (0.071)**</td>
</tr>
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<td></td>
<td>40.290 (1.293)**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.180 (0.007)**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.367(0.074)**</td>
</tr>
<tr>
<td>−2 log-likelihood</td>
<td>33,514</td>
<td>33,233</td>
<td>5,158.26**</td>
</tr>
</tbody>
</table>

S.E. in parentheses; * p < 0.05; ** p < 0.01; *** p < 0.001

*a The standard models are not nested within the multilevel model; hence, the log-likelihood statistics are not comparable with the full model.
parent firm’s prior experience within an industry is positively related to greater propensity for establishing a WOS \((b_{pM} = 0.20, \ p < 0.001)\) as well as the level of equity investment \((b_{pE} = 0.01, \ p < 0.05)\). In contrast, host nation experience is negatively related to both the probability for forming a WOS \((b_{pM} = -0.77, \ p < .001)\) and level of equity investment \((b_{pE} = -0.03, \ p < 0.001)\). Thus, our findings for WOS and industry experience support the view that experience encourages firms to exert higher levels of ownership structure control, while our findings for host country experience support the view that experience encourages lower levels of control. In addition, these findings are congruent with our results for specific brand investments, as they indicate that FDI experience has a stronger influence on mode of entry than on level of equity.

**Comparison with traditional analysis approaches**

In recent years, a growing number of researchers have argued that FDI ownership structure decisions are time-dependent and historically contextualized (Chang and Rosenzweig, 2001; Chen and Hennart, 2002; Madhok, 1997). In order to reflect these temporal and historical qualities, longitudinal research is often advocated (Yiu and Makino, 2002). Our multilevel analysis answers this call and extends findings obtained from the traditional univariate models employed by prior FDI research in four important ways.

First, we obtain more accurate estimates of the relative impact of TCA and experience predictors compared to prior studies that estimate entry mode and equity level in isolation. According to the standard models displayed in Table 1, advertising and R&D intensity encourage ownership structure control in the form of both WOS formation and high levels of equity investment. In addition, these models suggest that low uncertainty in the form of country risk is associated with greater control in terms of both entry mode and equity level.\(^5\) In contrast, our multilevel estimation indicates that the influence of transaction cost concerns is rather modest, as advertising intensity is associated with WOS propensity and higher levels of equity investment, but R&D intensity is not. Likewise, our multilevel estimation reveals that uncertainty has no influence on equity level and only a direct effect on entry mode. In sum, our model indicates that the effects of transaction cost concerns on FDI ownership structure decisions by Japanese parent firms may be weaker than suggested by transaction cost theory (e.g., Williamson, 1985).

Second, our simultaneous estimation of these two forms of FDI ownership structure reveals that the effect sizes for both TCA and experience indicants are an order of magnitude larger for entry mode than for equity level. This pattern of effects suggests that these two sets of indicants exert their primary influence upon the choice of entry mode. Thus, FDI researchers should be extremely cautious when examining equity level in isolation, as our findings support the contention that equity level is contingent on and follows from the entry mode decision (Hennart, 1991; Pan and Tse, 2000). This contingent nature of entry mode is not accounted for when standard estimation techniques such as logit or tobit are employed.

Third, predictors (e.g., R&D intensity) that appeared significant when using standard techniques such as logit or tobit regression virtually disappear when estimated using our multilevel procedure. This is due to the fact that multilevel estimation, unlike standard techniques, accounts for unobserved heterogeneity due to the idiosyncratic strategic preferences of parent firms as revealed by their prior patterns of FDI ownership and choice of host countries. Thus, because standard estimation techniques do not account for this unobserved heterogeneity, they appear to overstated the influence of some predictors (Raudenbush and Bryk, 2002).

Finally, but perhaps most importantly, our multilevel approach provides predictions of ownership structure that are capable of varying across both parent firms and the particular host nations in which they establish subsidiaries. In marked contrast, traditional fixed-effects models such as logit or tobit employ a single estimate of the dependent variable (entry mode in the logit case, equity participation in the tobit case) for a given set of predictor variables. Returning to our examples of

\(^5\) The results of these two models are congruent with the results of several prior studies (using similar samples and techniques). For example, both Delios and Henisz (2000) and Makino and Neupert (2000) also find that R&D intensity is positively associated with WOS entry mode. However, empirical FDI research is characterized by a considerable degree of inconsistent findings. Hence, there are also several studies that fail to find a significant association between R&D intensity and WOS entry mode (e.g., Chen and Hennart, 2002).
Sharp and Sony, a standard regression approach would estimate the overall (for all parent firms across all host nations) likelihood of WOS formation at 43 percent and the level of equity investment at 64 percent. In contrast, our multilevel estimation reveals that the probability of forming a WOS in China is 98 percent for Sony, but only 56 percent for Sharp. Similar, albeit less dramatic, distinctions can be seen for level of equity investment as well.

In sum, our findings highlight the need to examine FDI ownership structure as a complex and interrelated phenomenon. As shown by our comparative results, research that examines entry mode and equity level in isolation and does not account for idiosyncrasies in parent firm strategic preferences may lead to potentially misleading conclusions. We hope that our research motivates strategy researchers to exploit the rich capabilities of this useful analytic technique.

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REFERENCES

Padmanabhan P, Cho KR. 1999. Decision specific experience in foreign ownership and establishment

APPENDIX

In order to specify the bivariate FDI ownership structure decisions, we selectively expand the relevant observations in Table A.1, resulting in the individual observations displayed in Table A.2.

![Figure A1. Data structure and illustrative example](image)

Table A1. Original data

<table>
<thead>
<tr>
<th>Subsidiary ID</th>
<th>Entry mode</th>
<th>Equity level</th>
<th>Investing parent ID</th>
<th>Host nation ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JV</td>
<td>0.40</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>JV</td>
<td>0.30</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>WOS</td>
<td>0.97</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Table A2. Expanded dataset

<table>
<thead>
<tr>
<th>Obs.</th>
<th>Subsidiary ID</th>
<th>Response</th>
<th>Mode dummy</th>
<th>Equity dummy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>0.3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1</td>
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</table>