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Portfolio configuration and foreign entry decisions: A juxtaposition of real options and risk diversification theories

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Abstract

Research Summary: Research on foreign market entry has rarely considered that multinational firms' new entries may be affected by the configuration of their existing affiliates. We argue that in making entry decisions, firms take into account how an entry into a new location helps increase the operational flexibility of their affiliate portfolios due to options to switch operations across affiliates in case of diverging labor cost developments across host countries. We juxtapose this real options-based explanation with a risk diversification explanation. Analysis of Japanese multinational firms' foreign entry decisions suggests that the two explanations are complementary. We also establish portfolio-level boundary conditions to the influence of operational flexibility considerations on entry, in the form of product diversification and the nature of dispersion of labor cost levels.

Managerial Summary: When deciding on whether to enter a foreign market, managers of a multinational

firm are intuitively aware that they need to consider how the economic environment of the target host country is related to the environments of the existing countries in which the firm operates. The less the environments are correlated with each other, whether in terms of input cost or market demand conditions, the greater the chance that the firm may capture cost savings and reduce sales volatility globally. These benefits arise from a switching option to shift operations flexibly across countries and from an ability to reduce risk by holding a portfolio of diversified global investments. Our findings support both sets of considerations, suggesting that companies do give due attention to correlations in labor cost and market demand between the target host country to enter and the existing host countries.

KEYWORDS

flexibility, market entry, multinational firm, portfolio, real options, risk diversification

1 | INTRODUCTION

Multinational firms' foreign entry decisions have long occupied an important place in strategic management research. To date, scholars have applied a variety of theoretical perspectives to examine antecedents of foreign entry, including agglomeration effects and organizational agglomeration (Belderbos, Olffen, & Zou, 2011), competitive interactions between firms (Belderbos & Sleuwaegen, 2005; Gimeno, Hoskisson, Beal, & Wan, 2005), firm-specific characteristics such as experience and intangible assets (Shaver, Mitchell, & Yeung, 1997), as well as various environmental attributes such as industry growth (Kogut & Chang, 1996), market uncertainty (Chi & Seth, 2009), host country political risk (Henisz, 2002), and home and host country institutions more generally (Meyer, Estrin, Bhaumik, & Peng, 2009).

While prior research has significantly increased our understanding of the determinants of firms' foreign entry decisions, it has primarily treated each entry as an independent event and has rarely considered that entry decisions may be affected by how firms' existing portfolio of overseas affiliates is configured. In this paper, we draw on real options theory of multinational investment and argue that firms' new entries depend on characteristics of the configuration of their existing affiliate portfolios. Multinational firms take into account the contribution that an entry into a new location makes toward increasing the operational flexibility of their manufacturing affiliate portfolios, which represents a unique advantage of multinationality compared to purely domestic operations (Chi, Li, Trigeorgis, & Tsekrekos, 2019; de Meza & van der Ploeg, 1987; Kogut, 1985, 1989). In the parlance of real options, such increase in operational flexibility derives from the enhanced options to switch value-added activities across

internationally dispersed affiliates in case of diverging developments in labor and other input cost (Kogut & Kulatilaka, 1994). Our paper moves beyond prior real options studies of the performance implications of operational flexibility embedded in multinationality (Belderbos, Tong, & Wu, 2014; Lee & Makhija, 2009; Lee & Song, 2012; Reuer & Leiblein, 2000; Tong & Reuer, 2007a), by focusing on the question of how flexibility considerations may affect firms' foreign entry decisions in the first place and what the moderating factors for such considerations are.

We conceptually and empirically juxtapose the real options-based view of the role of affiliate portfolio configuration in affecting foreign entry with prior theories emphasizing the role of potential risk reduction resulting from foreign direct investment (FDI) under uncertainty (e.g., Aliber, 1970; Rugman, 1976, 1977). While risk diversification theory highlights the benefit of reduced variability of revenue streams and focuses on heterogeneous demand conditions across countries, the switching options view of multinationality gives attention to input cost conditions and emphasizes managerial and organizational capabilities to exploit differences in labor cost changes and exchange rate movements (Kogut, 1983, 1985, 1989; Kogut & Kulatilaka, 1994). In the real options view, differences and volatility in input cost developments among countries are a potential source of the multinational firm's advantage (Kogut & Kulatilaka, 1994). Our analysis juxtaposes real options related and risk reduction related influences and aims to identify their respective power in explaining entry patterns.

We test hypotheses on a longitudinal dataset including the population of listed Japanese multinational firms and their manufacturing affiliates across 60 host countries from 1989 to 2006. Specifically, we analyze whether the hazard of firms' entry into a particular host country in a particular year is a function of the expected increase in operational flexibility due to the addition of this location to the existing affiliate portfolio, while controlling for a host of other factors affecting entry in prior literatures, including the potential risk reduction consideration.

2 | THEORY AND HYPOTHESES

In the management literature, uncertainty has been often treated as synonymous with risk that should be avoided and diversified away (Kogut, 1991). For example, Rugman (1976, 1977) argues that multinational firms' broad geographic scope can help reduce the variability of revenue streams because differences in demand conditions across countries can average out idiosyncratic risks. This risk reduction logic of FDI is related to, but distinct from, the real options view of multinational investment (Kogut, 1983, 1985, 1989; Kogut & Kulatilaka, 1994). At a broad level, real options theory offers a more formal, finer-grained approach to analyzing firms' investment behavior under uncertainty than risk diversification theory. One specific, prominent difference between the two views is that whereas international diversification theory emphasizes "minimizing the risk of expected return" or the narrowing of the distribution of possible outcomes, real options theory highlights the capture of dynamic efficiency gains and upside potential by creating and exercising options "at the right place at the right time". Kogut and Kulatilaka (1994) elaborate this difference aptly in their analysis of the switching options created by multinationality: "The benefits of diversification are created by the reduction in variance of the overall portfolio of subsidiary results. An option, on the other hand, is valuable because it gives managerial discretion to respond profitably to the realization of uncertain events." Prior research also highlights that while it is easier for shareholders to obtain benefits of risk diversification by holding a portfolio of diversified securities (Morck & Yeung, 1991),

flexibility benefits requiring managerial action are much harder to obtain through stock market diversification (Kogut & Kulatilaka, 1994).

Switching options are known as input mix flexibility options because of the flexibility to switch between alternative input sources or locations during the production process (Trigeorgis, 1996). Although valuation of these compound options is difficult because of the complexity involved in managing calls and puts (Margrabe, 1978), significant evidence exists that firms and managers follow a real options "logic" in their strategic decision making (Kogut & Kulatilaka, 1994; McGrath & Nerkar, 2004), rather than estimating option values per se (Trigeorgis & Reuer, 2017). For instance, research has shown that multinational firms indeed shift their sourcing of inputs across locations in response to exchange rate movements (Belderbos & Zou, 2007; Rangan, 1998), and that operational flexibility enhances firm values (e.g., Chang, Kogut, & Yang, 2016; Sakhartov & Folta, 2014). Research using survey data and self-disclosed information has also reported that managers are aware of, and take into account, real options under uncertainty in multinational investment (e.g., Driouchi & Bennett, 2011).

In the section below, we first develop the baseline argument on the role of switching options (operating flexibility) in affecting firms' foreign entry decisions. We then propose boundary conditions that moderate the effect of operating flexibility on entry: (increase in the) dispersion of labor cost levels in the country portfolio, and industry diversification among the portfolio of affiliates. We further develop a hypothesis on the role of the host country's labor cost volatility in shaping switching options and entry. These hypotheses are also derived in a stylized simulation analysis described in online appendix Data S1. The simulation models examine the frequency of actual switching under different scenarios of cost correlations, cost level differences, switching costs and volatility, if a firm adds a third country to an existing portfolio of two. Switching occurs if the benefits of moving production, due to a change in labor cost rankings in a period, exceed switching costs.

2.1 | Hypotheses

Kogut (1985, 1989) emphasizes that compared with their domestic counterparts, multinational firms enjoy higher operational flexibility. If multinational firms can shift production activities across countries in response to (adverse) changes in environmental conditions, they can increase production efficiencies and are less vulnerable to environmental shocks (Kogut & Kulatilaka, 1994). Such switching opportunities are most salient if the environmental conditions in the various host countries in which firms operate do not develop in tune, but are uncorrelated, or negatively correlated. In that case, an input cost shock in one country provides opportunities to shift production to other countries where such a shock did not occur. Phrased in real options terms, having a portfolio of production affiliates provides options to switch under uncertainty concerning future cost developments.

While each affiliate provides an option to switch production in the future, the switching option value embedded in the investment depends on the extent to which cost developments in the country of the affiliate are correlated, or uncorrelated, with cost developments in other countries in which the firm operates. In cases of strong positive correlations, a production affiliate may provide redundant rather than valuable switching options. Theoretical research in real options recognizes that individual options within a portfolio may be wholly or partially redundant in their values due to overlaps among multiple investments (Trigeorgis, 1996), reducing the option value of the portfolio as a whole. In the context of multinational operations and

switching options, correlations in labor costs among the countries in which the firm operates have been proposed as a major source of redundancy (e.g., Belderbos & Zou, 2009; Dasu & Li, 1997; de Meza & van der Ploeg, 1987). For manufacturing firms, labor cost development is a particularly critical consideration in international manufacturing and a major driver of FDI (Kogut & Kulatilaka, 1994), consistent with the notions that minimizing production cost is one of the primary objectives of geographically distributed plant configurations (e.g., Belderbos et al., 2014; Dasu & Li, 1997; Fisch & Zschoche, 2012), and that (changes in) relative levels of labor costs in the host countries drive multinational firms' investment allocation decisions across countries (Belderbos, Fukao, Ito, & Letterie, 2013).

The arguments above suggest that one important consideration of the multinational firm when deciding whether to establish a manufacturing affiliate in a new location (host country) will be the role that this affiliate can assume in the firm's portfolio of affiliates in terms of the additional switching option value and operational flexibility that it generates. Such increase in switching option value due to the entry will be greater, the smaller the labor cost correlations of the new country with the countries already in the existing portfolio. Thus, we propose:

Hypothesis (H1) *("Flexibility increase") Multinational firms are more likely to enter a new host country, the less labor cost developments in that host country are correlated with labor cost developments in the existing foreign affiliate portfolio.*

We argue that the *dispersion* in labor cost *levels* in the different countries in which the firm operates affiliates can shape the effective opportunities for international production shifting. The exercise of switching options is most likely, and hence the flexibility value in a portfolio the greatest, if divergent labor cost developments lead to substantive changes in relative manufacturing costs of the countries in the portfolio, which firms can act upon. Whether changes in relative labor cost are substantive and actionable depends on the differences in labor cost levels of the countries in the portfolio. Differences in labor cost levels are affected by the focal entry into a new country, and are reflected in the increase (or decrease) in labor cost level dispersion in the portfolio due to the addition of the focal host country to the portfolio.

We posit that for switching opportunities to arise, increases in labor cost level differences should not be too large but neither be too small. The intuition, which is confirmed by simulation analysis, is relatively straightforward. In the case of very low dispersion and near-equal labor cost levels, there will be relatively little to gain in switching, as the magnitude of the changes in relative labor costs is also more limited and may not exceed switching costs. In the case of a very high dispersion in labor cost levels, the likelihood that for a given divergence in labor cost growth, there will be a meaningful change and reversal in labor cost levels calling for switching, is small. In addition, high labor cost differences may be associated with large differences in worker skills, productivity, production techniques, and product quality. As a result, it is likely that the different country locations are not effective substitutes, that is, the switching costs in terms of additional training or adaptations in the production process are overly high.

The arguments above suggest that addition of a new location to the affiliate portfolio influences switching options not only through a change in portfolio-level correlations in labor costs, but also through a change in the portfolio-level dispersion in labor cost levels. At low levels of labor cost dispersion increase due to an entry, switching opportunities are enhanced, as the increase in dispersion creates larger benefits of switching. In contrast, switching opportunities are likely to decrease if the labor cost level dispersion increase passes a certain threshold, when this dispersion implies differences in production techniques and skill levels that are too large to

allow for flexibility, and when overall switching opportunities embedded in the portfolio decline. This suggests an inverted U-shaped moderating effect of the increase in labor cost level dispersion on the impact of flexibility increase on entry, providing a boundary condition for the prediction of :

Hypothesis (H2) *The increase in labor cost level dispersion among the countries in the affiliate portfolio due to the entry into a host country moderates the positive impact of flexibility increase on firms' propensity to enter the host country [Hypothesis (H1)] in an inverted U-shaped manner.*

Shifting production among locations involves costs due to partial shutdowns and startups (de Meza & van der Ploeg, 1987), changing logistics and labor contracts (Kogut & Kulatilaka, 1994), and commitment of managerial time and attention (Driouchi & Bennett, 2011), in addition to the costs of maintaining affiliates operational in light of their switching option value. Indeed, such cost or price considerations involved in obtaining an option are often overlooked in prior research (c.f., Tong & Reuer, 2007b; Leiblein, Chen, & Posen, 2017; Posen, Leiblein, & Chen, 2018). The simulation analysis demonstrates the logic that switching opportunities will reduce when costs of switching are greater, ceteris paribus. Hence, the benefits gained from production switching should be evaluated against the cost incurred of maintaining and exercising the switching options. Thus, benefitting from the switching options in a portfolio of affiliates requires a relative ease of relocating production across affiliates, which implies similarity in specific assets, machinery, and facilities. If the affiliates in the portfolio have distinct resource requirements and operate in different industries, effective switching of production will be considerably hampered, and so gains in operating flexibility are less likely and will be less of a consideration in the entry decisions of the multinational firm. Therefore, the effect of increased flexibility due to entry hypothesized in (H1) will be reduced when the affiliates in the existing portfolio operate in different industries, which suggests the following hypothesis:

Hypothesis (H3) *The positive impact of flexibility increase on firms' propensity to enter a host country [Hypothesis (H1)] is negatively moderated by product diversification in firms' affiliate portfolios.*

In addition to the effect of portfolio-level labor cost correlation discussed earlier, a focal host country's labor cost volatility will also play an important role in shaping switching option values and affecting firms' decision to enter the country. Even if differences in labor cost developments are conducive to switching, the opportunity to switch may not increase if the focal country's labor cost exhibits little fluctuation such that major changes in relative labor costs are unlikely to occur. Hence, from a switching options perspective, the advantages of entry increase in labor cost volatility. We argue that this positive effect declines at higher levels of volatility. The intuition, backed up by simulation analysis suggesting that this holds across different labor cost correlation contexts, is as follows. When the focal country's labor cost volatility is very small, its labor cost level will likely remain above or below the labor cost levels of other host countries regardless of labor cost correlations in the portfolio, resulting in few switching opportunities. As the focal country's labor cost volatility increases, its future labor cost level is more likely to go above or below the labor cost levels of other countries, creating more switching opportunities. This effect loses power at higher

levels of labor cost volatility. When labor cost volatility in a focal country is already high, the country's labor cost level will already frequently go above or below the labor cost levels of other countries, such that additional volatility will provide fewer additional switching opportunities. This suggests the following hypothesis:

Hypothesis (H4) *Multinational firms are more likely to enter a new host country, the higher the labor cost volatility in that host country; the marginal effect of labor cost volatility declines at higher levels of volatility.*

3 | DATA AND METHODS

We used panel data covering the population of Japanese publicly listed multinational firms active in manufacturing industries provided by the Development Bank of Japan, to examine the role of switching options embedded in globally dispersed manufacturing networks. We included those firms that operated at least one manufacturing plant abroad during the sample period (1989–2006). We collected yearly data on these firms' manufacturing affiliates abroad from the *Directory of Overseas Investments* published yearly from 1989 by Toyo Keizai Inc., a data source often used in prior strategy research on Japanese multinationals. In total, 1,122 Japanese publicly listed manufacturing firms met this criterion. We analyze the sample firms' overseas manufacturing investments in 60 host countries, which account for more than 98% of all manufacturing investments abroad by the firms. In 47 out of the 60 countries, at least one Japanese firm established a manufacturing affiliate during the period. In total, there are 1,846 entries, among which 376 are subsequent entries. Most entries occurred in China (31.42%), followed by Thailand (9.64%), and the United States (6.18%).[1]

In the empirical analysis, we analyze firms' propensity to establish a manufacturing affiliate in a host country. The set of countries includes countries in which a firm established a manufacturing affiliate at some point during the investigation period (non-censored cases), as well as countries in which the firm did not invest by the end of the investigation period (censored cases). In total, the dataset consists of 49,437 firm-country pairs (potential entries), among which there are 1,846 actual entries. On average, each firm-country pair is observed for about 9 years, resulting in 462,216 observations in total.

3.1 | Variables and measures

3.1.1 | Dependent variable

The dependent variable is the hazard of a Japanese parent firm establishing a manufacturing affiliate in a host country. The decision of a focal firm to enter into a host country, *Market entry*, is a binary variable, which takes the value one when the firm enters a country, and zero otherwise. For any given firm, this variable is measured for all potential host countries and all years; thus, the unit of analysis is at the firm-country-year level.

[1]More elaborate descriptives are available in Data S1.

3.1.2 | Explanatory variables

The core hypothesis testing variable, *Flexibility increase*, is the reduction in labor cost correlation in the foreign affiliate portfolio due to the addition of a potential host country to the portfolio.[2] We follow Belderbos et al. (2014) to measure labor cost correlation as follows:

$$\text{Labor cost correlation} = \left[\sum_{j=1}^{N}\sum_{k=2}^{N}\frac{\sum_{t=0}^{-4}\left(C_{jt}-\bar{C}_j\right)\left(C_{kt}-\bar{C}_k\right)}{\delta_j\delta_k}\right] \Big/ \frac{N(N-1)}{2}, \text{where } j,k=1,\ldots,N; j<k \tag{1}$$

where C_{jt} and C_{kt} represent dollar-denominated labor costs in host countries j and k for year t, respectively; $\bar{C}_j$ and $\bar{C}_k$ denote average labor costs over the 5 years including the focal year ($t=0$) in countries j and k; and δ_j and δ_k are the standard deviations of labor costs within these past 5 years in countries j and k. N is the total number of countries in which the firm operates manufacturing affiliates. We calculate this variable for the existing portfolio of manufacturing affiliates, and for the new portfolio due to the addition of the focal country to the portfolio had the entry occurred. The core variable *Flexibility increase* is then calculated by *subtracting* the labor cost correlation in the new portfolio from the labor cost correlation in the existing portfolio.

To test Hypothesis (H2), we create a variable *Labor cost level dispersion increase*, which measures the increase in the dispersion of labor cost levels in the firm's portfolio of affiliates due to the addition of a new host country to the portfolio. We measure labor cost level dispersion in an affiliate portfolio as the standard deviation of labor cost levels of the host countries:

$$\textit{Laborcost level dispersion} = \sqrt{\sum_{j=1}^{N}\left(C_j-\bar{C}\right)^2/N}; \tag{2}$$

where $\bar{C}$ is the average labor cost in the portfolio, C_j is the labor cost level of host country j, and N is the total number of countries in which the firm operates manufacturing affiliates. The variable *Labor cost level dispersion increase* is then calculated by *subtracting* the labor cost level dispersion for the existing portfolio from the labor cost level dispersion for the new portfolio due to the addition of a new country to the portfolio had the entry occurred. We interact *Labor cost level dispersion increase* and its quadratic term with *Flexibility increase* to test Hypothesis (H2).

To test Hypothesis (H3), we create a variable *Diversification* that takes into account both the number of industries in which a firm operates and the relatedness between the industries in terms of characteristics of the underlying resources. Given the well-known concerns about entropy and concentric indices, we follow Nocker, Bowen, Stadler, and Matzler's (2016) approach to construct a matrix of industry relatedness by focusing on three salient resource

[2]Japan is not included in our portfolio definition. In the latter half of our observation period, many Japanese firms are reported to have relocated manufacturing activities abroad, maintaining only sales and R&D operations or component production in Japan. As we do not have similar data on domestic manufacturing plants as we have on overseas plants, we cannot accurately determine portfolios including Japan.

characteristics: capital intensity (total capital/employees), material intensity (material costs/sales), and R&D intensity. We construct the matrix based on data for all publicly listed firms in Japan using the Development Bank of Japan database. The relatedness-weighted *Diversification* measure for the affiliate portfolio is then defined as (1—relatedness) times the number of industries in the portfolio. The greater the value of (unrelated) *Diversification*, the greater the difficulty and cost to shift production flexibly across countries, reducing the importance of flexibility in entry decisions. Finally, to test Hypothesis (H4), we include *Host country labor cost volatility* and its quadratic term. This variable is calculated as the standard deviation of labor cost over a five-year period (from t_{-4} to t) for the focal country.

3.1.3 | Control variables related to risk reduction

As noted earlier, we aim to juxtapose real options explanations of entry with risk reduction considerations. We include measures of the two core dimensions of portfolio risk: volatility and correlation in demand. First, we include the variable *Demand correlation reduction* to control for multinational firms' diversification motives that are unrelated to real options logics. Rugman (1976, 1977) suggests that multinational firms can diversify away unsystematic risk through international production, although subsequent work by finance scholars argue and show that such hedge is better left to shareholders through holding a portfolio of diversified securities (e.g., Morck & Yeung, 1991). Conceptually, when an entry reduces GDP correlations among the host countries in the portfolio and demand developments thus become more divergent across the countries, multinational firms can achieve risk reduction. *Demand correlation reduction* measures the degree to which entry into a potential host country reduces the correlations in GDP across the overall portfolio. This variable is expected to take on a positive sign.

Second, we include the variable *Demand volatility reduction*, which measures the degree to which entry into a potential host country reduces demand volatility. To construct the variable, we first calculate the variance of GDP growth over the past 5 years for each host country in the existing portfolio and take the average. The difference between this average value and the variance of GDP growth of the focal host country then indicates the extent to which adding this country to the existing portfolio reduces GDP volatility in the overall portfolio. This variable is expected to have a positive sign.[3]

3.1.4 | Other control variables

We include a broad range of controls at the firm and host country levels. At the host country level, prior studies suggest that political risk can deter entry into host countries. We include a measure of *Political risk* developed by Henisz (2002). Second, we include the level of *Labor cost* (in thousand dollars) in the potential host country, as well as its *Labor cost growth* in the year prior to entry. Third, to control for market attractiveness, we include the logarithm of *GDP* as well as its *GDP growth* (in percentage terms) in the year prior to entry (Tong & Li, 2013). Fourth, we control for agglomeration effects related to previous Japanese investments in the

[3]*Demand correlation reduction* and *demand volatility reduction* may correlate with other (differences in) country characteristics, such as those related to the institutional environment. We follow prior research and take GDP as the indicator of demand conditions, while controlling for political risk.

potential host country (Belderbos et al., 2011). Toward this end, we include the number of existing Japanese manufacturing affiliates in the country, scaled by 1,000 (*Japanese agglomeration*), and the number of existing affiliates in the same industry as the focal Japanese parent firm (*Japanese industry agglomeration*). Fifth, we control for demand uncertainty at the host country level (Campa & Goldberg, 1995). To construct the variable *Host country demand uncertainty*, we follow prior research (Kogut, 1991) and regress a host country's GDP over 5 years (from t_{-4} to t) against time, and then take the root mean squared error divided by the value of GDP in year t. We include this variable (in percentage terms) and its quadratic term.

We include two control variables related to the inclusion of first entries as well as subsequent entries in the analysis. The dummy variable *Prior affiliate investment* takes the value 1 if a firm has an existing manufacturing affiliate in the host country. Prior investment may spur further investments due to experience effects and potential collocation benefits (Kogut & Chang, 1996), but it may also reduce the probability of entry in favor of further geographic diversification. In addition, we include the interaction between *Prior affiliate investment* and *Flexibility increase*, to allow for the possibility that switching considerations play a lesser role for subsequent entries, given that a manufacturing affiliate is already present in the host country to take up such a switching role.

The models also include a range of other firm-specific controls. *Firm size* is measured as the logarithm of total assets (in 1,000 Japanese Yen). *Tobin's q* as a proxy for a firm's intangible assets, and its role of intangible assets in foreign direct investment has been widely documented (e.g., Morck & Yeung, 1991). *Export ratio*, the value of exports divided by the firm's total sales, captures preferences to concentrate manufacturing in Japan and possible substitution effects between export and overseas production. The average operating years of manufacturing affiliates of the firm (*International manufacturing experience*) controls for experience effects that may affect new investment decisions. A dummy variable *Sales affiliate* indicates whether the firm operates a sales office in a host country, which may work as a platform for manufacturing investment (Kogut & Chang, 1996). Finally, we allow for a U-shaped effect of multinationality on the propensity to enter new countries, by including *Multinationality*, measured as the number of host countries in the existing portfolio, and its quadratic term (Reuer & Leiblein, 2000). Finally, yet importantly, we include a full set of host country, industry, and year fixed effects, to control for country and industry heterogeneity as well as changing macroeconomic conditions.

3.2 | Econometric models

Following prior studies on foreign market entry, we conduct survival analysis to model Japanese firms' entry into new host countries. Since our data on entries are measured in discrete time (years) rather than in continuous time, we use the complementary loglog (cloglog) model, which is derived from the Cox proportional hazard model and is appropriate for continuous duration processes that are observed only at discrete intervals. Since each firm can consider entering multiple countries simultaneously, we cluster error terms at the firm level (Lin & Wei, 1989). We adopt a strict definition of the onset of "risk." Specifically, we assume that a country is "at risk" of hosting new entries by a Japanese firm only when (a) the firm has established at least one foreign sales or manufacturing affiliate abroad (showing an intention to internationalize), and (b) the country has hosted at least one sales or manufacturing affiliate of a Japanese firm (showing a minimum general attractiveness for Japanese FDI).

4 | RESULTS

Table 1 reports descriptive statistics and correlations of variables. The correlation coefficients and separate diagnostic analysis do not suggest multicollinearity concerns.

Table 2 reports results of the cloglog models of the determinants of foreign entry. Model 1 is the baseline model only including the control variables. Models 2–5 add the hypotheses testing variables in turn, while Model 6 includes all variables. Likelihood ratio tests indicate that Model 2 provides a significant improvement in explanatory power over the reference model (Model 1) and that Models 3–6 further increase model fit compared to Model 2.

Starting with the risk reduction related control variables, the coefficient of *Demand correlation reduction* is positive and significant in all models, indicating that countries with less correlated demand developments with the existing countries in the portfolio, allowing the firm to potentially diversify away unsystematic risk, are indeed associated with a higher likelihood of entry. The coefficient of *Demand volatility reduction* is also positive and significant, confirming the idea that firms find it more attractive to enter into new host countries that reduce average GDP volatility in firms' portfolio of affiliates. These results suggest that risk reduction considerations indeed matter to firms' foreign entry decisions as traditional risk diversification theories of FDI suggest (Rugman, 1976, 1977).

Among the other control variables in Model 1, the positive and significant signs of *Japanese agglomeration* and *Japanese industry agglomeration* suggest that agglomeration and potential mimicry effects play out at a broad level between Japanese firms (Belderbos et al., 2011). There is evidence for a nonmonotonic relationship between host country demand uncertainty and entry, with a negative and significant coefficient of *Host country demand uncertainty*, and a positive and (marginally) significant coefficient for its quadratic term, consistent with prior research on entry (Folta & O'Brien, 2004; Li & Li, 2010). Larger firms (*Firm size*) exhibit a greater propensity to enter into new countries, while *International manufacturing experience* has a negative and significant coefficient. One explanation for the latter finding is that firms operating older affiliates, which had their major expansions in the past, are less inclined to establish new affiliates. *Export ratio* is negative and significant, suggesting that substitution effects between foreign and domestic production affect international expansion. There is a nonlinear effect of *Multinationality* on the propensity to enter: the inflection point is reached at 15 countries, which is only a feature of the most internationalized firms in the sample, but which still falls within the sample range of (1–32). The positive and significant coefficient of *Sales affiliate* suggests that prior investment to expand market reach in the host country increases the propensity that the firm establishes manufacturing affiliates in that country as well.

Turning to the hypothesis testing variables, *Flexibility increase* has a positive and significant coefficient in Models 2–6, supporting the baseline that the greater *Flexibility increase*, the higher the firm's propensity to enter a new host country. Hypothesis (H2)) suggests that there is a moderating effect of *Labor cost level dispersion increase* regarding the impact of *Flexibility increase* on the propensity to enter and that this effect takes an inverted-U shape. In both Models 3 and 6, the coefficient of the linear interaction term is significantly positive and that of the quadratic interaction term is significantly negative, in support of this hypothesis. The inflection point of the moderating effect (in Model 6) is at a *Labor cost level dispersion increase* of 1.16 (i.e., a 1.16 standard deviation increase in labor cost level dispersion). This point falls in the actual range of *Labor cost level dispersion increase* [−0.726, 4.162], with 5.46% of observations exhibiting a larger value than the inflection point value. In line with Hypothesis (H3), the coefficient of the interaction term between *Flexibility increase* and *Diversification*, in Models 4 and

TABLE 1 Descriptive statistics and correlations

Variables	μ	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Market entry	0.004	0.063																					
2. Flexibility increase	−0.083	0.468	**0.012**																				
3. Labor cost level dispersion increase	0.329	0.604	**−0.027**	**−0.266**																			
4. Diversification	0.534	0.902	**0.027**	**0.131**	**−0.241**																		
5. Host country labor cost volatility	1.429	1.585	**−0.028**	**−0.141**	**0.377**	**0.013**																	
6. Demand volatility reduction	−0.023	0.083	**0.021**	**−0.024**	−0.002	**0.029**	**−0.106**																
7. Demand correlation reduction	−0.010	0.373	**0.005**	**0.028**	**0.050**	**0.045**	**0.069**	**0.100**															
8. Prior affiliate investment	0.018	0.132	**0.089**	**0.024**	**−0.066**	**0.077**	**−0.033**	**0.040**	**0.007**														
9. Political risk	0.423	0.164	**−0.053**	**−0.014**	**0.125**	**0.010**	**0.314**	**−0.039**	**0.037**	**−0.060**													
10. Labor cost	1.321	1.243	**−0.029**	**−0.107**	**0.424**	**0.009**	**0.847**	**0.081**	**0.078**	**−0.028**	**0.369**												
11. Labor cost growth	0.051	0.153	**0.007**	**−0.142**	**0.016**	−0.001	**0.064**	**−0.163**	**−0.013**	0.002	**−0.041**	**0.023**											
12. GDP	25.846	1.375	**0.043**	**−0.028**	**0.098**	**−0.027**	**0.247**	**0.022**	**0.050**	**0.092**	**0.142**	**0.343**	**0.034**										
13. GDP growth	6.928	12.894	**0.013**	**−0.104**	−0.002	0.002	**0.030**	**−0.260**	0.000	0.004	**−0.096**	**−0.025**	**0.698**	**−0.018**									
14. Japanese agglomeration	0.060	0.130	**0.136**	**−0.050**	**−0.005**	**−0.043**	**−0.148**	**0.090**	**−0.038**	**0.244**	**−0.234**	**−0.122**	**0.019**	**0.332**	**0.016**								
15. Japanese industry agglomeration	6.545	18.941	**0.114**	**−0.031**	**−0.013**	**−0.052**	**−0.108**	**0.068**	**−0.025**	**0.218**	**−0.181**	**−0.091**	**0.016**	**0.251**	**0.014**	**0.748**							
16. Host country demand uncertainty	6.269	5.506	**−0.016**	**0.152**	**−0.049**	0.004	**0.009**	**−0.586**	**−0.055**	**−0.016**	**0.034**	**−0.143**	**−0.087**	**−0.048**	**−0.074**	**−0.036**	**−0.033**						
17. Firm size	18.304	1.445	**0.035**	**0.132**	**−0.279**	**0.444**	**0.007**	**0.037**	**0.030**	**0.087**	−0.003	**−0.009**	**0.005**	**−0.055**	**0.007**	**−0.055**	**−0.049**	**−0.006**					
18. Tobin's q	1.265	0.595	0.002	**−0.037**	**−0.021**	**−0.013**	**0.023**	**−0.057**	**−0.013**	**−0.007**	**−0.029**	**−0.029**	**0.029**	**−0.041**	**0.032**	**−0.017**	**0.015**	**−0.032**	**0.035**				
19. Export ratio	0.078	0.156	**0.010**	**0.014**	**−0.075**	**0.073**	**−0.031**	**−0.031**	**0.010**	**−0.006**	**−0.012**	**−0.045**	**−0.032**	**−0.061**	**−0.045**	**−0.016**	**0.036**	**−0.015**	**0.178**	**0.123**			
20. Int'l manufacturing experience	8.216	6.132	0.000	**0.037**	**−0.066**	**0.015**	**0.005**	**0.050**	**0.007**	**0.013**	−0.001	**0.004**	**0.007**	**0.008**	**0.009**	0.002	**0.005**	0.003	**0.157**	**−0.027**	**0.034**		
21. Multinationality	3.448	2.960	**0.042**	**0.183**	**−0.360**	**0.502**	**0.027**	**0.078**	**0.061**	**0.152**	**0.015**	**0.021**	0.003	**−0.039**	**0.008**	**−0.066**	**−0.034**	**0.006**	**0.594**	**0.006**	**0.109**	**0.154**	
22. Sales affiliate	0.052	0.222	**0.077**	**0.010**	**−0.068**	**0.093**	**0.015**	**0.067**	**0.009**	**0.528**	**−0.059**	**0.054**	−0.001	**0.198**	**−0.008**	**0.253**	**0.236**	**−0.045**	**0.170**	**0.014**	**0.077**	**0.032**	**0.174**

Note: Correlations in bold are significant at $p < .01$.

TABLE 2 Cloglog Hazard model analysis: the determinants of foreign entry

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Flexibility increase		0.311	0.440	0.236	0.320	0.370
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Labor cost level dispersion increase × flex. Increase			0.839			0.716
			(0.000)			(0.000)
(Labor cost level dispersion increase)^2 × flex. Increase			−0.370			−0.309
			(0.001)			(0.004)
Diversification × flexibility increase				−0.350		−0.264
				(0.000)		(0.000)
Host country labor cost volatility					0.330	0.303
					(0.015)	(0.025)
(Host country labor cost volatility)^2					−0.043	−0.039
					(0.070)	(0.095)
Demand volatility reduction	1.321	1.271	1.181	1.273	1.384	1.305
	(0.006)	(0.008)	(0.014)	(0.008)	(0.004)	(0.007)
Demand correlation reduction	0.468	0.492	0.480	0.492	0.484	0.474
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prior affiliate investment		−0.061	−0.069	−0.061	−0.061	−0.068
		(0.715)	(0.676)	(0.715)	(0.714)	(0.684)
Prior affiliate investment × flexibility increase		−0.059	0.097	0.091	−0.070	0.180
		(0.847)	(0.756)	(0.762)	(0.819)	(0.560)
Political risk	0.288	0.301	0.300	0.307	0.302	0.306
	(0.404)	(0.381)	(0.383)	(0.372)	(0.384)	(0.379)
Labor cost	−0.177	−0.200	−0.222	−0.209	−0.243	−0.266
	(0.274)	(0.215)	(0.171)	(0.196)	(0.195)	(0.158)

TABLE 2 (Continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Labor cost growth	0.054	0.074	0.068	0.063	0.058	0.046
	(0.831)	(0.770)	(0.788)	(0.804)	(0.819)	(0.857)
GDP	−0.163	−0.041	−0.064	−0.082	−0.226	−0.262
	(0.520)	(0.872)	(0.802)	(0.749)	(0.405)	(0.336)
GDP growth	0.005	0.006	0.005	0.005	0.005	0.005
	(0.187)	(0.158)	(0.169)	(0.173)	(0.201)	(0.222)
Japanese agglomeration	0.555	0.495	0.500	0.521	0.576	0.594
	(0.040)	(0.069)	(0.067)	(0.056)	(0.042)	(0.036)
Japanese industry agglomeration	0.002	0.002	0.002	0.002	0.002	0.002
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)
Host country demand uncertainty	−0.034	−0.035	−0.036	−0.034	−0.036	−0.036
	(0.040)	(0.038)	(0.031)	(0.040)	(0.031)	(0.027)
(Host country demand uncertainty)^2	0.001	0.001	0.001	0.001	0.001	0.001
	(0.035)	(0.032)	(0.029)	(0.033)	(0.063)	(0.057)
Firm size	0.220	0.220	0.220	0.221	0.219	0.220
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's q	−0.037	−0.034	−0.032	−0.031	−0.033	−0.028
	(0.586)	(0.614)	(0.637)	(0.652)	(0.633)	(0.677)
Export ratio	−0.549	−0.554	−0.561	−0.560	−0.556	−0.566
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)
International manufacturing experience	−0.037	−0.036	−0.036	−0.036	−0.036	−0.036
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multinationality	0.268	0.266	0.263	0.264	0.266	0.262
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

TABLE 2 (Continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Multinationality^2	−0.009	−0.009	−0.009	−0.009	−0.009	−0.009
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sales affiliate	0.479	0.494	0.487	0.490	0.494	0.486
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Labor cost level dispersion increase	−0.786	−0.724	−0.706	−0.720	−0.717	−0.700
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(Labor cost level dispersion increase)^2	−0.135	−0.142	−0.103	−0.133	−0.144	−0.108
	(0.346)	(0.324)	(0.476)	(0.353)	(0.319)	(0.456)
Diversification	0.047	0.044	0.046	0.049	0.045	0.049
	(0.119)	(0.143)	(0.128)	(0.109)	(0.140)	(0.108)
Constant	−5.291	−8.381	−7.737	−7.329	−3.926	−2.934
	(0.428)	(0.212)	(0.250)	(0.277)	(0.578)	(0.678)
Observations	462,216	462,216	462,216	462,216	462,216	462,216
AUC	0.9239	0.9244	0.9250	0.9248	0.9245	0.9253
Log likelihood	−8,706.228	−8,699.216	−8,689.959	−8,693.646	−8,696.148	−8,684.335
LLR test (χ^2): Expanded model versus basic model[a]		14.02	18.51	11.14	6.14	29.76
		(0.003)	(0.000)	(0.001)	(0.047)	(0.000)

[a]For Model 2, the comparison model is Model 1; for Models 3–6, the comparison model is Model 2. p values based on firm-clustered error terms in parentheses (two-tailed tests). Country fixed effects, industry fixed effects, and year fixed effects are included and are all jointly significant. All models are significant at $p < .001$. AUC (area under the ROC curve) is a goodness of fit measure.

6, is negative and significant. Hypothesis (H4) predicts that *Host country labor cost volatility* has a positive effect on firms' propensity to enter but that the marginal effect is declining. This hypothesis receives qualified support, as shown by the positive and significant coefficient of the variable, and the negative and marginally significant ($p < .10$) coefficient of the quadratic term in Models 5 and 6. The inflection point of *Host country labor cost volatility* is relatively close to the maximum in the sample and is broadly in line with the notion of a declining marginal impact.

The implied magnitudes of the effects confirmed meaningful effects of the variables related to the real options logic as well as the variables representing risk reduction. A one standard deviation increase in the variable *Flexibility increase* increases the hazard of entry by 21%. The moderation effects are also sizeable, with the effect of *Flexibility increase* estimated at 79% at the inflection point of *Labor cost level dispersion increase* under low *Diversification*, but easily reaching zero at high levels of *Diversification* and at particularly low or high values of *Labor cost level dispersion increase*. The effect on the hazard of entry due to *Host country labor cost volatility* is 23% in the mean of the variable. The risk reduction variables also have sizeable estimated effects: an 11 and 19% increase in the hazard of entry can be calculated for the risk reduction variables *Demand volatility reduction* and *Demand correlation reduction*, respectively.

Our results were robust to employing a different measure of diversification, the use of Cox models with different assumptions regarding the onset of risk, and to limiting the analysis to actual entries or countries with larger numbers of entries.

5 | DISCUSSION

Our study juxtaposed switching option considerations (Kogut, 1985; de Meza & van der Ploeg, 1987; Kogut & Kulatilaka, 1994) with the more traditional risk diversification motivation for foreign expansion (Rugman, 1976, 1977). Our hypotheses on the role of flexibility derived from real options theory provided predictions that are either contrasting or complementing risk diversification theory that focuses on the role of entry in reducing demand and revenue stream volatility in firms' host country portfolios. Our results showed that both theories have important roles to play in explaining firms' foreign entry decision, with meaningful and comparable magnitudes of the implied effects.

Our study contributes to the real options literature by identifying several important moderating factors of the influence of flexibility (switching options) considerations on firms' market entry decisions. First, we show that (changes in) labor cost level dispersion in the portfolio moderate the effect of flexibility on entry in an inverted U-shaped fashion. Specifically, modest differences between a target country's labor cost level and existing countries' labor cost levels enhance switching opportunities, as small differences provide few switching benefits while large differences make switching less likely. Second, to the extent that affiliates operate in different industries, the difficulty of switching activities between affiliates is increased, thus reducing the salience of flexibility considerations for market entry decisions. Third, we also find that labor cost volatility in the host country increases the likelihood of entry, as such volatility uniformly increases switching opportunities. Overall, our study responds to calls to contribute to real options research by focusing on how an individual investment decision may be shaped by related investments in the portfolio (Chi et al., 2019; Tong & Reuer, 2007b; Trigeorgis & Reuer, 2017).

Most prior studies on foreign entry have in common that they treat entry decisions as events that can be analyzed independently, neglecting the question of how such decisions may be affected by firms' existing portfolio of overseas affiliates. Our study adds to the literature

adopting a portfolio approach to examine international market entry and exit (e.g., Belderbos & Zou, 2009; Fisch & Zschoche, 2012), by taking into account that new affiliates can be complementary or redundant in the firm's affiliate portfolio. Drawn from real options theory, this portfolio approach has been adopted in prior research (Trigeorgis, 1996), but has found little application in the (foreign) market entry literature.

Our study also contributes to international strategy research more generally. For instance, though we do not investigate performance effects, our study's design and findings have implications for the literature on multinationality and performance (e.g., Lu & Beamish, 2004). Despite the significant contributions made, scholars suggest that this literature has neglected the role of host country environments (e.g., Belderbos, Tong, & Wu, 2019; Hennart, 2011). The consequences of multinationality are not just a manifestation of the number of host countries in which to operate, but are shaped by attributes of the existing countries in the portfolio, as well as attributes of new host countries firms seek to enter. From a managerial perspective, our work echoes calls in prior research that to reap benefits of switching options, managers need to be aware of such options and have the capabilities in place to manage them effectively (Belderbos et al., 2014; Kogut, 1985; Posen et al., 2018). Future work aimed at understanding the specific ways multinationality affects firm performance will benefit from explicitly considering the configuration and heterogeneous characteristics of firms' portfolio of host countries and affiliates, as well as managerial awareness and capabilities to act upon these.

We note several avenues for future research that can help address some of the limitations of our study. Future research can examine the generalizability of our findings by comparing the role of operating flexibility in affecting entries of firms based in different home countries. While our paper joins recent work to study the operating flexibility of firms based in countries other than the United States, some of our findings may be seen as being more salient to Japanese firms. For instance, Japanese multinationals have invested substantially in a broad set of countries with relatively heterogeneous operating environments, making switching options considerations and their boundaries potentially more important. Future research focusing on other forms of country heterogeneity that our study is not able to capture will also be particularly valuable. Finally, our study has juxtaposed real options and risk diversification explanations of foreign entry, and we encourage future research to develop other approaches to identify specific contexts where one explanation may dominate the other. As multinational firms are increasingly operating across countries with heterogeneous conditions, understanding how they coordinate operations among a portfolio of affiliates to achieve flexibility and other benefits is likely to take on greater importance.

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SUPPORTING INFORMATION

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