DUAL-OPTION SUBSIDIARIES AND EXIT DECISIONS IN ECONOMIC CRISIS

Chris Changwha Chung • Seung-Hyun Lee • Jeoung-Yul Lee

ABSTRACT

This study examines the dual implications of dual-option subsidiaries on exit decisions during times of economic crisis. Retaining dual-option subsidiaries in crisis-stricken countries means leaving a shadow option open for future growth once a crisis ends. However, MNCs may encounter problems pursuing either option due to challenges in managing dual-option subsidiaries with clashing strategic mandates. The equivocal nature of dual-option subsidiaries points to the possibility of another factor playing an important moderating role in exit decisions—subsidiary performance—which has been rarely considered in the MNC real options literature. Our primary argument is that lower subsidiary performance increases the influence of shadow option value embedded in dual-option subsidiaries. Analyzing a sample of Korean MNCs' subsidiaries in Asian economies, we find that when profitability falls, subsidiaries with dual options are less likely to be exited than those with single options.

KEYWORDS: Within-country growth, across-country flexibility, dual options, subsidiary exit, economic crisis.

AUTHORS

C. C. Chung
Department of International Management, Korea University Business School
Korea University, Korea
E-mail: chungc@korea.ac.kr

S. H. Lee
Department of Organizations, Strategy and International Management, School of Management
University of Texas at Dallas, USA
E-mail: lee.1085@utdallas.edu

J. Y. Lee
Department of International Business, College of Management,
Hongik University, Korea
E-mail: jeoungyul@hongik.ac.kr

INTRODUCTION

Real options theory contains two categories of foreign direct investment (Belderbos & Zou, 2009; Kogut & Kulatilaka, 1994a). According to a within-country growth option perspective, multinational corporations (MNCs) use foreign subsidiaries to determine host country potential and to create growth options (Brouthers & Dikova, 2010; Fisch, 2011; Kogut, 1991; Kulatilaka & Perotti, 1998; Li & Li, 2010; Tong, Reuer & Peng, 2008; Xu, Zhou & Phan, 2010). According to an across-country flexibility option perspective, MNCs can enhance operational flexibility by shifting value chain activities across multinational networks in response to changing conditions in individual countries (Allen & Pantzalis, 1996; Fisch & Zschoche, 2012.; Driouchi & Bennett, 2011; Lee & Makhija, 2009a, 2009b; Rangan, 1998; Tang & Tikoo, 1999). Most real options studies focus on either within-country growth-driven or across-country flexibility-driven subsidiaries, and therefore pay insufficient attention to subsidiaries embedded with both options; in this paper we will refer to these as *dual-option subsidiaries.* We argue that from the MNC top management standpoint, some MNC subsidiaries might not be seen as either within-country growth-driven or across-country flexibility-driven. Potentially a third kind, dual-option subsidiaries might be another kind of subsidiary that MNC top management may have in mind in making decisions on the fate of each subsidiary.

The lack of attention to dual-option subsidiaries has resulted in a significant gap in the literature, since the majority of MNC-affiliated subsidiaries operating in two or more countries (including an MNC's home country) tend to take advantage of both within-country growth and across-country flexibility options (Belderbos & Zou, 2007). For example, Chung, Lee, Beamish, and Isobe (2009) argue that MNC subsidiaries can have within-country growth and across-country operational flexibility options, with the first based on a host country's economic growth

potential and the second emphasizing operational flexibility among affiliated subsidiaries within a multinational network.

Here we investigate the implications of dual-option subsidiaries for host country exit decisions. Most real options research has focused on investment initiation decisions (e.g., Brouthers & Dikova, 2010; Cuypers & Martin, 2010; Li & Li, 2010; Tong & Li, 2011). The question of whether firms use real options logic when considering reasons for salvaging an investment has received much less attention (Li, James, Madhavan & Mahoney, 2007). Exit decision research is important because many entry decisions can be characterized as mistakes (Vivarelli & Santarelli, 2007), resulting in considerable weeding-out activity as firms abandon individual overseas investments (Bartelsman, Scarpetta & Schivardi, 2005). According to Boddewyn (1979), one of every two foreign subsidiaries added to an MNC network is abandoned. Similar foreign entry-to-foreign exit ratios have been reported by Padmanabhan (1993) for UK MNCs; Barkema, Bell and Pennings (1996) for Dutch MNCs; and Benito (1997) for Norwegian MNCs.

Our study context—times of economic crisis—helps establish a boundary condition under which one option has greater value over another. During such periods, a dramatic downturn in a local economy can make a location unattractive for MNCs motivated to exploit within-county growth, while at the same time creating a low-cost manufacturing opportunity for MNCs capable of exploiting the operational flexibility embedded in their multinational networks (Chung et al., 2010; Lee & Song, 2012). Exit decisions for dual-option subsidiaries are more complex due to their dual implications: retaining such subsidiaries preserves options for future growth in local markets once a crisis period passes, therefore dual-option subsidiaries are less likely to be exited because of the value associated with a shadow within-country growth option.

However, some MNCs find it difficult to pursue either option due to conflicts between dual-option subsidiaries in terms of strategic mandates. Such conflicts may increase the odds of exiting a dual-option subsidiary.

The equivocal nature of dual-option subsidiaries points to the possibility of another factor playing an important moderating role in exit decisions: subsidiary performance. The international business literature clearly states that the most important reason for subsidiary exits is unsatisfactory performance (Benito, 2005; Rugman, 1979), yet subsidiary performance is rarely incorporated into MNC real options research. We therefore compared the likelihood of subsidiary exit changes as a function of performance level between dual- and single-option subsidiaries. A real options approach is most appropriate when other quantifiable benefits are negligible (O'Brien & Folta, 2009; Tiwana, Wang, Keil & Ahluwalia, 2007). When subsidiary performance is strong, the option value of continuing in a host country is negligible because MNCs are unlikely to exit profitable subsidiaries. However, when subsidiary performance is weak and when easily quantifiable benefits of retention are absent, the option value of persistence should become more influential. In this paper we will describe our proposal that the shadow option value embedded in dual-option subsidiaries becomes more influential when subsidiary performance is weak. In other words, when profitability is low, dual-option subsidiaries are less likely to be exited than those pursuing a single option.

THEORY AND HYPOTHESIS DEVELOPMENT

Much of past real options research has focused on MNC flexibility at the corporate level, therefore insufficient attention has been paid to individual subsidiaries compared to aggregate subsidiary operations. Real options researchers have tended to assume that MNC subsidiaries are

more or less equal because they belong to the same parent firm, and have therefore treated them as if their individual real options orientations do not affect MNC flexibility (Allen & Pantzalis, 1996; Tang & Tikoo, 1999). It is only recent that real options researchers have started examining the role of each subsidiary in its contribution to the MNC flexibility (Fisch & Zschoche, 2012; Lee & Song, 2012). For example, Fisch and Zschoche (2012) examine the impact of MNC subsidiaries' country uncertainties on new subsidiary establishment. Lee and Song (2012) examine an interrelationship among MNC subsidiaries in such way that production increase in a particular subsidiary would be associated with production decrease in another. While these studies look further into the role of each MNC subsidiary in the whole MNC subsidiary network, still these studies do not look into the real options orientation of each MNC subsidiary.

Each subsidiary's real options orientation is based on its path-dependent strategic assignment (Kogut & Kulatilaka, 1994b; Rangan, 1998). MNCs interested in penetrating host country markets make subsidiary localization their priority in order to establish better fits with market preferences (Johnson, 1995; Monteiro, Avidsson & Birkinshaw, 2008; Ozsomer & Gencturk, 2003; Roth & Morrison, 1990). In comparison, compatibility with other subsidiaries is a priority for MNCs interested in improving coordination within their global production networks (Allen & Pantzalis, 1996; Kogut & Kulatilaka, 1994a; Tang & Tikoo, 1999). While this strategy might be viewed as cumbersome during normal times, it can provide significant benefits when a local market collapses. However, among subsidiaries established for within-country growth purposes, host market difficulties increase the odds of being exited (Benito & Welch, 1997; Borde, Madura & Akhigbe, 1998; Kogut, 1991).

Real options theory is based on the idea that in times of uncertainty, opportunities to wait before making an irreversible decision have value; traditional net present value criteria fail to

consider this flexibility benefit (Dixit, 1992; Fisch, 2011; Li & Li, 2010). For an MNC that has established a subsidiary in a host country, uncertainty and sunk costs give rise to an option value embedded in a delayed decision to exit (Dixit, 1989; Pindyck, 1991). If an MNC can delay its exiting decision so as to determine if the benefits of exiting cover the sunk costs of the investment, then the ability to wait has value. The usual subsidiary exit decision threshold therefore increases beyond conventional net present value (Dixit & Pindyck, 1994). If the benefit of abandoning a subsidiary exceeds this higher threshold, the subsidiary exit option is immediately exercised; otherwise the MNC is more likely to stay in a local market longer than expected under traditional net present value criteria. Under real options logic, an MNC will be reluctant to exit a local market in an uncertain environment due to the irreversible loss of any possibility to recoup its investment should local conditions improve.

A *shadow option* is a latent option that remains after an initial option is exercised (Bowman & Hurry, 1993; Myers, 1984). Dual-option subsidiaries are less likely than across-country flexibility-driven subsidiaries to be abandoned, since maintaining such subsidiaries means retaining a shadow option for growth after a crisis period is over. Thus, a dual-option subsidiary may exercise its across-country flexibility option during an economic crisis, but return to a within-country growth emphasis when the host country recovers. Another way to state this is that for dual-option subsidiaries, an across-country option provides preferential access to future within-country option opportunities (Bowman & Hurry, 1993). Erikson (2002) and Hurry, Miller and Bowman (1992) argue that exercising the first option should be regarded as the purchase of a shadow option. For example, exercising an across-country operational flexibility option gives an MNC with dual-option subsidiaries the right, but not the obligation, to exercise the shadow

within-country growth option once uncertainty is resolved. Based on this rationale, our first hypothesis is expressed as:

Hypothesis 1A: During times of economic crisis, subsidiaries with dual options are least likely to be exited, followed by subsidiaries with either across-country flexibility or within-country growth options, in that order.

However, real options research reminds us that flexibility has costs (Bowman & Moskowitz, 2001; Driouchi & Bennett, 2011; Kogut, 1989) and that MNC subsidiaries retaining dual options may not be able to exercise either one. For example, an MNC subsidiary that tries to simultaneously satisfy local preferences and coordinate production with subsidiaries in other countries may not achieve maximum results in either situation. In addition, while divesting a subsidiary during an economic crisis may be a viable option from a real options perspective (McGrath, 1999; Lee, Peng & Barney, 2007), the presence of a shadow option may influence MNCs to wrongly maintain subsidiaries with very uncertain futures (Adner & Levinthal, 2004). As Kogut (1989: 388) observes, "Having the potential to exercise flexibility is a far cry from having the management system to do it." Poor organizational design and incorrect behavioral considerations can present problems for MNCs that have dual options (Barnett, 2008; Busby & Pitt, 1997; Driouchi & Bennett, 2011)—for instance, they may be stuck at an in-between point, unable to successfully exercise either one (Dess & Davis, 1984). In some situations, the value of combined options can be lower than when each option is pursued independently (Vassolo, Anand & Folta, 2004).

Furthermore, due to localization pressure, the possibility exists of dual-option subsidiaries developing strategies that are very different from those used by across-country option subsidiaries. Rangan (1988), Reuer and Leiblein (2000), Driouchi and Bennett (2011) perceive the potential lack of compatibility among MNC network subsidiaries and residual

differences in administrative styles as reasons why MNCs are less operationally flexible than they should be. In a similar vein, Collis (1991: 53) argues that "administrative heritage will lead firms to maintain production configurations that do not optimize production costs." In addition, if conflicting purposes associated with dual options result in substantially higher costs, then the value of keeping dual option subsidiaries falls. This explains Rangan's (1998) argument that real options flexibility investments must be analyzed in terms of opportunity costs: when those costs reach a certain level, it is best to divest dual-option subsidiaries during times of economic crisis.

These factors explain why dual options subsidiaries are more likely to be exited than those limited to the across-country option. However, dual-option subsidiaries are still less likely to be exited than subsidiaries limited to the within-country growth option because they can extract some operational flexibility benefits via global production networks when local markets collapse. A competing hypothesis to H1A is therefore proposed as:

Hypothesis 1B: During times of economic crisis, across-country flexibility-driven subsidiaries are least likely to be exited, followed by dual-option subsidiaries and within-country growth-driven subsidiaries, in that order.

The equivocal nature of dual-option subsidiaries points to the possibility of another factor playing a moderating role in exit decisions. According to the international business literature, the most basic reason for exiting a subsidiary in a host country is unsatisfactory performance (Benito, 2005; Rugman, 1979). However, performance has rarely been considered in the real options literature. We argue that unsatisfactory performance increases the likelihood of within-country growth-driven subsidiaries being exited compared to across-country flexibility-driven or dual-option subsidiaries. Within-country growth-driven subsidiaries are in the worst position because they cannot flexibly use resources from other subsidiaries in their MNC networks (Birkinshaw, Holm, Thilenius & Arvidsson, 2000). Poor local market demand can exacerbate existing

performance problems for within-country growth-driven subsidiaries, thus increasing the potential for divestiture. In contrast, during times of economic crisis, across-country flexibility-driven subsidiaries and dual-option subsidiaries are better positioned to show their value in terms of exchange rate depreciation, lower factor costs, and other favorable trade conditions (Chung et al., 2010; Jacque & Vaaler, 2001).

Comparing poorly performing dual-option and across-country flexibility-driven subsidiaries, we propose that dual-option subsidiaries are less likely to be exited. According to the real options literature, an options approach is most salient when other quantifiable benefits are negligible (Tiwana et al., 2007). When subsidiary performance is high, the option value of persisting in a host country becomes immaterial, since it is highly unlikely that an MNC will shut down a profitable subsidiary. However, when performance is low and the benefits of keeping a subsidiary are difficult to quantify, the option value of persistence becomes much more influential (O'Brien & Folta, 2009).

The value of a subsidiary is the sum of the value of current assets, the value of current discounted expected future cash flows, plus the option value (Fisch, 2010; Myers, 1984). If the expected cash flows are large, then the real option value will not affect the decision to exit, as the expected cash flows are sufficient to keep the subsidiary alive. However, if cash flows are small or negative, real option value may just tip the balance between exit or survival. Despite performance problems, dual-option subsidiaries still have a latent shadow (within-country growth) option (Bowman & Hurry, 1993), an advantage that provides incentives to retain subsidiaries with dual options during times of economic crisis. Poorly performing across-country flexibility-driven subsidiaries do not have this advantage. Hypothesis 2 therefore states that the lower the subsidiary performance, the greater the influence of shadow option value embedded in

dual-option subsidiaries, making them less likely than across-country flexibility-driven subsidiaries to be exited:

Hypothesis 2: Among poorly performing subsidiaries, those with dual options are less likely to be exited than those with a single option—specifically, across-country flexibility-driven and within-country growth-driven subsidiaries, in that order.

METHODOLOGY

Data and Sample

We used multiple data sources to collect information about MNCs and their foreign subsidiaries. Three primary sources for foreign subsidiary data were the Korean Ministry of Strategy and Finance (KMSF) database, WISEfn (a database of publicly traded Korean firms), and the Korea Listed Companies Association. In addition, we gathered further information on foreign subsidiaries from each MNC's homepage, LEXIS/NEXIS, company information in the Munwha Daily Newspaper, and the Korea Information Service (KIS) website. In light of our setting—the 1997 Asian economic crisis—we narrowed our sample to Korean MNCs' subsidiaries in Asia. We selected the 1997-2001 observation period for two reasons. First, the crisis started in 1997, and its effects were felt for several years. Second, MNCs are generally conservative in their exit decisions due to the difficulties of re-entry. We therefore wanted to observe a sufficiently long time period to capture the true impacts of the crisis on exit decisions, and to prevent a potentially serious right-censoring problem. We also recognized that foreign subsidiaries in manufacturing, service, and trade industries may not perform the same way during times of economic crisis. To reduce confounding potential across different industry types, we followed the well-established real options practice of focusing on manufacturing subsidiaries (Allen & Pantzalis, 1996; Belderbos & Sleuwaegen, 2005).

After compiling a sample of Korean overseas manufacturing subsidiaries, we matched parent firm data with WISEfn, KIS- (Korea Information Service-) Value, and the Korea Listed Companies Association. We then matched host country information from the World Development Indicator of the World Bank Group to the compiled data. The final sample consisted of 703 manufacturing subsidiaries of 479 Korean MNCs operating in fourteen Asian countries. After testing Hypotheses 1A and 1B based on the full sample, we split the full sample into two sub-samples to compare the exit likelihood of poorly-performing subsidiaries with that of well-performing subsidiaries (i.e., Hypothesis 2). Based on the cut-off criterion of break-even, we split the full sample into a sample of high return on assets (ROA) group (369 subsidiaries) and a sample of low ROA group (334 subsidiaries).

Variables

Dependent Variable

We operationalized subsidiary exit (D_{xt}) as the withdrawal of a subsidiary from a host country (Benito, 1997, 2005; Li, 1995; Torneden, 1975), taking a value of 1 if subsidiary x was exited at time t and 0 otherwise. Observations were either continued until the subsidiary was exited, or right-censored at the end of 2001 if $D_{xt} = 0$ for subsidiary x throughout the time period. During the observation period, 305 (10%) of the subsidiaries in our full sample were exited, 146 (9%) of the subsidiaries in a split sample of high ROA group were exited, and 159 (11%) of the subsidiaries in a split sample of low ROA group were exited.

Independent Variables

We operationalized across-country flexibility-driven subsidiaries, within-country growth-driven subsidiaries and dual-option subsidiaries based on the percentage of across-country

(*versus* within-country) intra- and inter-firm sales. On one dimension, a foreign subsidiary may have sales to its affiliates in the home, host, and third countries (i.e., intra-firm sales) and unrelated companies in the home, host, and third countries (i.e., inter-firm sales) (Lee & Song, 2012). On the other dimension, a subsidiary may have sales to its affiliates and unrelated companies within the host country (i.e., within-country sales) and those outside the host country (i.e., across-country sales). Given the focus of the present paper, our operationalization is based on the dimension of across-country *versus* within-country sales rather than that of intra-firm *versus* inter-firm sales. An across-country flexibility-driven subsidiary can have some within-country sales in the host country. A within-country growth-driven subsidiary can also have some across-country sales outside the host country. As such, we did not arbitrarily categorize different types of subsidiaries based on categorical dummy variables but instead located them in the continuous spectrum based on the percentage of across-country (*versus* within-country) intra- and inter-firm sales. On the continuous spectrum, within-country growth-driven, dual-options, and across-country flexibility-driven subsidiaries can be located in a meaningful order as shown in Figure 1-A.

[Insert Figure 1 about here]

The purpose of the present paper is not to measure exact percentage cut-off points between the three different types of subsidiaries but to compare the exit likelihoods of different subsidiaries whose across-country (*versus* within-country) sales percentages vary in a meaningful order on the continuous spectrum. Given the purpose of the paper, what is really important is the shape of the relationship between the percentage of across-country (*versus* within-country) intra- and inter-firm sales and exit likelihood. Depending on the shape of the relationship, we can test the competing hypotheses proposed in the paper (i.e., Hypotheses 1A

and 1B). H1A proposes that subsidiaries with dual options are least likely to be exited, followed by across-country flexibility-driven subsidiaries and within-country growth-driven subsidiaries, in that order. In this case, we test a curvilinear (more specifically, right-tilted U-shaped) relationship between the percentage of across-country intra- and inter-firm sales and exit likelihood as shown in Figure 1-B. On the left side of the figure, within-country growth-driven subsidiaries whose across-country sales are less than the other two types are most likely to be exited. In the middle, as across-country sales increase, dual-option subsidiaries are less likely to be exited than within-country ones but still more likely to be exited than across-country ones. On the right side of the figure, across-country flexibility-driven subsidiaries are more likely to be exited than dual-option subsidiaries but still less likely to be exited than within-country growth-driven subsidiaries. As such, the exit likelihood of across-country flexibility-driven subsidiaries stays below that of within-country growth-driven subsidiaries.

On the other hand, H1B proposes that across-country flexibility-driven subsidiaries are least likely to be exited, followed by dual-option subsidiaries and within-country growth-driven subsidiaries, in that order. In this case, we propose a linear and negative-slope relationship between the percentage of across-country intra- and inter-firm sales and exit likelihood as shown in Figure 1-C. In the left side of the figure, within-country growth-driven subsidiaries whose across-country sales are less than the other two types are most likely to be exited. In the right side of the figure, across-country flexibility-driven subsidiaries whose across-country sales are more than the other two types are least likely to be exited. In the middle, dual-option subsidiaries whose across-country sales are in-between are less likely to be exited than within-country ones but more likely to be exited than across-country ones.

As shown by the competing hypotheses, dual-option subsidiaries have dual implications for exit decisions. The equivocal nature of dual-option subsidiaries points to the possibility that subsidiary performance is a critical factor influencing exit decisions. As such, we investigated change in exit likelihood between dual- and single-option subsidiaries with the split samples based on the financial performance level of the subsidiary. We used each subsidiary's return on assets (ROA) to measure the financial performance of the subsidiary, and split the full sample based on the cut-off criterion of break-even (i.e., 0%).

Control Variables

We controlled for a set of factors that are also expected to influence subsidiary exit. First, we controlled for country-level variables. Using World Bank data, we incorporated the direct effect of economic crises by including change in gross domestic product (GDP) in host countries. We also incorporated the economic condition of home country. To reflect economic conditions in Korea, we measured the extent of GDP decline/growth. Further, we controlled for annual per capita GDP for both host and home countries. We controlled for the cultural distance between Korea and each host country based on Kogut and Singh's (1988) index. We controlled for the political stability/risk of each host country using the BERI (Business Environment Risk Intelligence) political risk index—a higher score means less political problems. Various manufacturing industries were controlled for using the Korean equivalent of a two-digit Standard Industry Classification code. Eighteen manufacturing industries were included.

At the MNC level, we controlled for the financial conditions of parent firms using their debt-to-equity ratio levels. Also, intangible assets have traditionally been viewed as influencing the international activity patterns of parent firms. We controlled for the effects of intangible assets by using measures of advertising intensity (advertising expenditures as a percentage of

total sales) and R&D intensity (R&D expenditures as a percentage of total sales). We also controlled for MNC size, which was measured as the log of total assets of the MNC. Further, we controlled for the international experience (in years) of the MNC.

Alternative explanations at the subsidiary level were also controlled for. There may be an alternative possibility that subsidiaries may dramatically alter their within-country and across-country trade activities to deal with an economic crisis. According to the real options literature, real options are developed through a path-dependent process since current options derive from the previous strategic choices made and the corresponding subsidiary development path (Rangan, 1998). In other words, the strategic orientation behind the subsidiary operation has a sticky implication for the option development of the subsidiary (Kogut and Kulatilaka, 1994b). Because of cost issues such as a high cost of switching from within-country to across-country orientations, subsidiaries do not generally change their within-country/across-country trade activities "dramatically" (Rangan, 1998). Nevertheless, to preempt any potential room of this alternative explanation, we controlled for change in the across-country (*versus* within-country) intra- and inter-firm sales of subsidiaries.

We also incorporated a subsidiary's ROA because subsidiary performance was a crucial determinant for divestment decisions (Benito, 2005; Rugman, 1979). Further, we made attempts to capture the effect of subsidiary size to control for liabilities of smallness or structural inertia. Subsidiary size was measured in terms of the total assets of a subsidiary. We controlled for the effects of human resource strategies by incorporating the ratio of Korean expatriates working at a subsidiary (i.e., expatriates as a percentage of total number of subsidiary employees). Finally included was a dummy variable indicating whether a subsidiary in a crisis-stricken country was wholly owned or part of a joint venture.

Statistical Analysis

Since the majority of subsidiaries were not exited by the end of the observation period, utilizing right-censored cases was considered essential to our research (Allison, 1984; Efron, 1974). We therefore used semi-parametric event history models to investigate subsidiary exit hazards. Since the hazard distribution function for subsidiary exit during a period of economic crisis is *a priori* unknown, we fitted a Cox semi-parametric model that was not based on an *a priori* assumption regarding the nature or shape of the hazard function (Cox, 1972; Cox & Oakes, 1984).

Correlations across exit decisions were likely, given that a parent firm often had multiple foreign subsidiaries. To adjust for this problem, we used Huber and White estimators in the semi-parametric event history models when estimating variance in the random contributions of unobserved factors (Therneau & Grambsch, 2000).

RESULTS

Summary statistics and correlation matrices for the variables are presented in Tables 1A (full sample), 1B (a split sample of high ROA subsidiaries) and 1C (a split sample of low ROA subsidiaries). Pearson statistics were calculated for correlations between two continuous variables, biserial statistics were calculated for correlations between a dichotomous and continuous variable, and tetrachoric statistics for correlations between two dichotomous variables. Results from variance inflation factor and tolerance level tests confirmed the absence of multicollinearity.

[Insert Tables 1A, 1B and 1C about here]

Empirical results for the full sample are shown in Table 2. In Model 1 we included control variables only. In Model 2, we introduced the linear term of across-country (*versus* within-country) intra- and inter-firm sales percentage in order to test the linear and negative-slope relationship between across-country sales percentage and exit likelihood proposed in H1B. In Model 3, we added the squared term of across-country (*versus* within-country) intra- and inter-firm sales percentage in order to test the curvilinear and U-shaped relationship between across-country sales percentage and exit likelihood proposed in H1A.

[Insert Table 2 about here]

In Model 2, the negative coefficient of the linear term of across-country sales percentage suggests that there may be a linear and negative-slope relationship between across-country sales percentage and exit likelihood, but the result is not statistically significant. Therefore, H1B is not supported. In Model 3 in which we added the squared term of across-country sales percentage, the negative coefficient of the linear term and the positive coefficient of the squared term indicate that there may be a curvilinear and U-shaped relationship between across-country sales percentage and exit likelihood, but the results are not statistically significant. Thus, H1A is not supported either. In the full sample, neither H1A nor H1B is supported.

The above inclusive results suggest that there may be another critical factor influencing the relationship between across-country sales percentage and exit likelihood. As such, we split the full sample into a sample of high ROA subsidiaries and that of low ROA subsidiaries, and then examined the relationship between across-country sales percentage and exit likelihood in each sample. Empirical results for the sample of high ROA subsidiaries are shown in the section A of Table 3. In Model 4 we included control variables only. In Model 5, we incorporated the linear term of across-country sales percentage to see if there is a linear and negative-slope

relationship between across-country sales percentage and exit likelihood. In Model 6, we added the squared term of across-country sales percentage to see if there is a curvilinear and U-shaped relationship between across-country sales percentage and exit likelihood. Empirical results for the sample of low ROA subsidiaries are shown in the section B of Table 3. For Models 7-9 in the section B of Table 3, we followed the same procedure used in Models 4-6.

[Insert Table 3 about here]

In Model 6 (a sample of high ROA subsidiaries), the negative linear term of across-country sales percentage is statically significant (β=-0.029; $p<0.01$) but the positive squared term of across-country sales percentage is not statistically significant (β=0.0001; ns). On the other hand, in Model 9 (a sample of low ROA subsidiaries), both the negative linear term of across-country sales percentage (β=-0.053; $p<0.001$) and the positive squared term of across-country sales percentage (β=0.0005; $p<0.001$) are statically significant. These results indicate that a linear and negative-slope relationship between across-country sales percentage and exit likelihood is salient in the sample of high ROA subsidiaries, whereas a curvilinear and U-shaped relationship between across-country sales percentage and exit likelihood is salient in the sample of low ROA subsidiaries.

Based on the empirical results obtained, we illustrated the relationship between across-country sales percentage and exit likelihood for high ROA subsidiaries in Figure 2. Figure 2 shows a linear and negative-slope relationship between across-country sales percentage and exit likelihood. In the left side of Figure 2, within-country growth-driven subsidiaries whose across-country sales are less than the other two types are most likely to be exited. In the right side of Figure 2, across-country flexibility-driven subsidiaries whose across-country sales are more than the other two types are least likely to be exited. In the middle of Figure 2, dual-option

subsidiaries whose across-country sales are in-between are less likely to be exited than within-country growth-driven subsidiaries but more likely to be exited than across-country flexibility-driven subsidiaries.

[Insert Figure 2 about here]

In Figure 3, we illustrated the relationship between across-country sales percentage and exit likelihood for low ROA subsidiaries. Figure 3 shows a right-tilted U-shaped relationship between across-country sales percentage and exit likelihood. Starting from the left side of Figure 3, within-country growth-driven subsidiaries whose across-country sales are less than the other two types are most likely to be exited. As across-country sales increase in the middle of Figure 3, dual-option subsidiaries are less likely to be exited than within-country growth-driven subsidiaries but still more likely to be exited than across-country flexibility-driven subsidiaries. In the right side of Figure 3, the right-tilted U-shaped relationship suggests that across-country flexibility-driven subsidiaries are more likely to be exited than dual-option subsidiaries but still less likely to be exited than within-country growth-driven subsidiaries. As such, the exit likelihood of across-country flexibility-driven subsidiaries stays below that of within-country growth-driven subsidiaries but above that of dual-option subsidiaries.

[Insert Figure 3 about here]

Results from a comparison of dual-option subsidiaries and across-country flexibility-driven subsidiaries indicate a greater exiting likelihood for dual-option subsidiaries when both types are profitable. However, when performance level decrease below break-even, across-country flexibility-driven subsidiaries are more likely to be exited than dual-option subsidiaries. Combined, these results support H2.

DISCUSSION AND CONCLUSION

Past real options studies have focused on either the within-country growth (Brouthers & Dikova, 2010; Fisch, 2011; Kogut, 1991; Kulatilaka & Perotti, 1998; Li & Li, 2010; Tong et al., 2008; Xu et al., 2010)) or across-country flexibility option perspective (Allen & Pantzalis, 1996; Driouchi & Bennett, 2011; Lee & Makhija, 2009a, 2009b; Rangan, 1998; Tang & Tikoo, 1999), generally overlooking the dual implications of dual-option subsidiaries despite their significant presence in MNC networks. Here we examined the dual implications of dual-option subsidiaries on exit decisions during times of economic crisis. While it is easy to understand why within-country growth-driven subsidiaries are most likely to be divested when local markets collapse (Chung et al., 2010), it is difficult to predict what will happen in a scenario involving dual-option and across-country flexibility-driven subsidiaries. Maintaining dual-option subsidiaries in crisis-stricken countries means leaving a shadow option open for future growth after the crisis subsides (Bowman & Hurry, 1993; Erikson, 2002; Hurry et al., 1992; Myers, 1984). However, due to challenges in managing conflicting interests in dual-option subsidiaries, MNCs may find it difficult to pursue either option (Barnett, 2008; Busby & Pitt, 1997; Driouchi & Bennett, 2011; Reuer & Leiblein, 2000). Accordingly, we failed to find any significant difference in exit likelihood between dual-option and across-country flexibility-driven subsidiaries.

The inconclusive nature of our dual- and across-country option subsidiary findings suggests the involvement of another factor—subsidiary performance. While cited as one of the most important factors influencing subsidiary exit decisions in the international business literature (Benito, 2005; Rugman, 1979), the moderating role of subsidiary performance is under-examined in the MNC real options literature. According to our results, across-country flexibility-driven subsidiaries were less likely to be exited than dual-option subsidiaries when both were

profitable, suggesting that the cost-saving positions of across-country flexibility-driven subsidiaries were better aligned with the strategic requirements of MNCs during the crisis period. However, lack of profitability in across-country flexibility-driven subsidiaries did not necessarily put them in better positions compared to dual-option subsidiaries. Poorly performing dual-option subsidiaries are generally less likely than poorly-performing across-country flexibility-driven subsidiaries to be exited because they have greater value in terms of their within-country growth shadow option (Bowman & Hurry, 1993; Erikson, 2002).

Our finding that dual-option subsidiaries have greater option value than across-country flexibility-driven subsidiaries when a lack of profitability is involved suggests that the shadow option value of dual-option subsidiaries increases during times of uncertainty. When subsidiaries are profitable, there is less need to think about future potential value because current value already provides a strong incentive to maintain them. However, the fates of financially unsound subsidiaries may be decided by the presence of a shadow option (O'Brien & Folta, 2009). Future option value gains prominence when other quantifiable benefits such as profitability are negligible (Tiwana et al., 2007). The value of a subsidiary is the sum of the value of current assets, the value of current discounted expected future cash flows, plus the option value (Fisch, 2010; Myers, 1984). If the expected cash flows are large, then the real option value will not affect the decision to exit, as the expected cash flows are sufficient to keep the subsidiary alive. However, if cash flows are small or negative, real option value may just tip the balance between exit or survival (Bowman & Hurry, 1993). That is, when performance is low and when easily quantifiable benefits of keeping a subsidiary in a host country evaporate, its future option value gains influence when deciding its fate. Keeping dual-option subsidiaries alive means having growth options in a local market once the crisis ends.

Regarding managerial implications, awareness of how past investment decisions and strategic orientations affect specific subsidiaries during crises can provide managers with *a priori* insight. Although operational flexibility is normally considered an adaptive and reactive response to environmental change, MNC subsidiaries may use their operational flexibility to proactively redefine market uncertainties. The real options perspective helps MNC managers battle with, capitalize on, and even befriend the uncertainty that is a constant factor in today's global economy. During times of uncertainty, the fate of a subsidiary is determined by a mix of current and future options value. Therefore, making quick decisions to exit all subsidiaries experiencing financial trouble can have detrimental consequences. During times of uncertainty, exit decisions should be based on option valuation, including considerations of shadow option value.

It should be noted that keeping options open may not be a cure-all strategy. Especially when a subsidiary is in good standing in its performance, this logic of keeping latent shadow (within-country growth) option may not apply (Bowman & Hurry, 1993). However, keeping future options open might be beneficial when a subsidiary is ailing from performance problems. This is why O'Brien and Folta (2009) and Tiwana et al. (2007) argue that considering potential future option value becomes more important when other quantifiable benefits such as profitability are negligible. In this sense, when it comes to the divestment decisions of MNC subsidiaries, managers may have to think of at least two things at the same time, subsidiary performance and keeping latent shadow option. Unless both of them are considered at the same time, mangers may make a blunder of mistakenly forgoing potential future gains by divesting all poorly performing subsidiaries.

Our findings are based on a sample of Korean MNCs' overseas subsidiaries in Asia. As such, there might be an 'Asian or Korean MNC' effect since they are more likely to have a long-

term view compared to their Western (American and European) counterparts. This may limit the generalizability of the findings of this study. However, this sample does provide a counterpoint to the dominant view in the literature based on Western multinational firms. For the development of MNE real options theory, such an alternative view point is valuable.

REFERENCES

Adner R, Levinthal D. 2004. What is not a real option: Considering boundaries for the application of real options to business strategy. *Academy of Management Review* **29**: 74-85.

Allen L, Pantzalis C. 1996. Valuation of the operating flexibility of multinational corporations. *Journal of International Business Studies* **27**: 633–653.

Allison PD. 1984. *Event History Analysis*. Sage: Newbury Park, CA.

Barkema H, Bell J, Pennings J. 1996. Foreign entry, cultural barriers, and learning. *Strategic Management Journal* **17**: 151–166.

Bartelsman E, Scarpetta S, Schivardi F. 2005. Comparative analysis of firm demographics and survival: Evidence from micro-level sources in OECD countries. *Industrial and Corporate Change* **14**: 365–391.

Barnett M. 2008. An attention-based view of real options reasoning. *Academy of Management Review* **39**: 606-628.

Belderbos R, Sleuwaegen L. 2005. Competitive drivers and international plant configuration strategies: A product-level test. *Strategic Management Journal* **26**: 577-593.

Belderbos R, Zou, J. 2007. On the growth of foreign affiliates: Multinational plant networks, joint ventures, and flexibility, Journal of International Business Studies 38: 1095-1112.

Belderbos R, Zou J. 2009. Real options and foreign affiliates divestments: A portfolio perspective, *Journal of International Business Studies* **40**: 600-620.

Benito G. 1997. Divestment of foreign production operations. *Applied Economics* **29**: 1365–1377.

Benito G. 2005. Divestment and international business strategy. *Journal of Economic Geography* **5**: 235–251.

Benito G, Welch L. 1997. De-internationalization. *Management International Review* **37**: 7–25.

Boddewyn JJ. 1979. Foreign divestment: magnitude and factors. *Journal of International Business Studies* **10**: 21–26.

Borde S, Madura J, Akhigbe A. 1998. Valuation effects of foreign divestitures. *Managerial and Decision Economics* **19**: 71-79.

Bowman E, Hurry D. 1993. Strategy through the option lens: An integrated view of resource investments and the incremental-choice process. *Academy of Management Review* **18**: 760–782.

Bowman E, Moskowitz G. 2001. Real options analysis and strategic decision making. *Organization Science* **12**: 772-777.

Brouthers KD, Dikova D. 2010. Acquisitions and real options: The greenfield alternative. *Journal of Management Studies* **47**: 1048-1071.

Busby J, Pitts C. 1997. Real options in practice: An exploratory survey of how finance officers deal with flexibility in capital appraisal. *Management Accounting Research* **8**: 169-186.

Cox, D. 1972. Regression models and life-tables. *Journal of the Royal Statistical Society, Series B (Methodological)* **34**: 187–220

Cox, D., Oakes, D. 1984. *Analysis of Survival Data*. Chapman and Hall: London, UK.

Chung CC, Lee SH, Beamish PW, Isobe T. 2010. Subsidiary expansion/contraction during times of economic crisis. *Journal of International Business Studies* **41**: 500–525.

Cuypers I, Martin X. 2010. What makes and what does not make a real option? A study of equity shares in international joint ventures. *Journal of International Business Studies* **41**: 47-69.

Dess G, Davis P. 1984. Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance. *Academy of Management Journal* **27**: 467-488.

Dixit AK. 1989. Entry and exit decisions under uncertainty. *Journal of Political Economy* **97**: 620- 638.

Dixit AK. 1992. Investment and hysteresis. *Journal of Economic Perspectives* **6**: 107-132.

Dixit AK, Pindyck RS. 1994. *Investment under Uncertainty*, Princeton University Press: Princeton, NJ.

Dodwell Marketing Consultants. 1997. *Industrial Groupings in Japan: The Anatomy of the Keiretsu (12th ed.)*. Tokyo, Japan.

Doukas J, Patzalis A. 2003. Geographic diversification and agency costs of debt of multinational firms. *Journal of Corporate Finance* **9**: 59–92.

Driouchi T, Bennett D. 2011. Real options in multinational decision-making: Managerial awareness and risk implications. *Journal of World Business* **46**: 205-219.

Efron, B. 1974. The efficiency of Cox's likelihood function for censored data. *Journal of the American Statistical Association* **72**: 557–565

Erikson T. 2002. Entrepreneurial capital: the emerging venture's most important asset and competitive advantage. *Journal of Business Venturing* **17**: 275-290.

Fisch JH. 2011. Real call options to enlarge foreign subsidiaries - The moderating effect of irreversibility on the influence of economic volatility and political instability on subsequent FDI. *Journal of World Business* **46**: 517.

Fisch JH., Zschoche M. 2012. The role of operational flexibility in the expansion of international production networks. *Strategic Management Journal* (forthcoming), DOI: 10.1002/smj.1999

Henisz WJ. 2000. The institutional environment for multinational investment. *Journal of Law Economics & Organization* **16**: 334–364.

Horaguchi H. 1992. *Foreign Direct Investment of Japanese Firms: Investment and Divestment in Asia.* University of Tokyo Press: Tokyo, Japan.

Hurry D, Miller A, Bowman E. 1992. Calls on high-technology: Japanese exploration of venture capital investments in the United States. *Strategic Management Journal* **13**: 85-101.

Isobe T, Makino S, Montgomery D. 2000. Resource commitment, entry timing, and market performance of foreign direct investments in emerging economies: The case of Japanese international joint ventures in China. *Academy of Management Journal* **43**: 468-484.

Jacque L, Vaaler P. 2001. The international control conundrum with exchange risk: An EVA framework. *Journal of International Business Studies* **32**: 813-832.

Kogut B. 1989. A note on global strategies. *Strategic Management Journal* **10**: 383-389.

Kogut B. 1991. Partially-owned subsidiaries and the option to acquire and expand. *Management Science* **37**: 19–33.

Kogut B, Kulatilaka N. 1994a. Operating flexibility, global manufacturing, and the option value of a multinational network. *Management Science* **40**: 123–139.

Kogut B, Kulatilaka N. 1994b. Options thinking and platform investments: investing in opportunity, *California Management Review* **36**: 52-71.

Kulatilaka N, Perotti EC. 1998. Strategic growth options, *Management Science* **40**, 744-758.

Lee SH, Peng M, Barney J. 2007. Bankruptcy law and entrepreneurship development: A real options perspective. *Academy of Management Review* **32**: 257-272.

Lee SH, Makhija M. 2009a. Flexibility in internationalization: Is it valuable during an economic crisis? *Strategic Management Journal* **30**: 537–555.

Lee SH, Makhija, M. 2009b. The effect of domestic uncertainty on the real options value of international investments. *Journal of International Business Studies* **40**: 405–420.

Lee SH, Song S. 2012. Host country uncertainty, inter-MMC subsidiary shift of production, and foreign subsidiary performance: The case of Korean multinational corporations. *Strategic Management Journal* (forthcoming), DOI: 10.1002/smj.1982

Li JT. 1995. Foreign entry and survival: Effects of strategic choices on performance in international markets. *Strategic Management Journal* **16**: 333–351.

Li J, Li Y. 2010. Flexibility versus commitment: MNEs' ownership strategy in China. *Journal of International Business Studies* **41**: 1550-1571.

Li Y, James B, Madhavan R, Mahoney JT. 2007. Real options: Taking stock and looking ahead, *Advances in Strategic Management* **24**: 33–66.

McGrath R. 1999. Falling forward: real options reasoning and entrepreneurial failure. *Academy of Management Review* **24**: 13-30.

Monteiro L, Avidsson N, Birkinshaw J. 2008. Knowledge flows within multinational corporations; Explaining subsidiary isolation and its performance implications. *Organization Science* **19**: 90-107.

Myers S. 1984. Finance theory and financial strategy. *Interfaces* **14**: 126-137.

Ozsomer A, Gencturk E. 2003. A resource-based mode of market learning in the subsidiary: The capabilities of exploration and exploitation. *Journal of International Marketing* **11**: 1-29.

O'Brien JP, Folta TB. 2009. Sunk costs, uncertainty and market exit: A real options perspective. *Industrial and Corporate Change* **18**: 807–833

Padmanabhan P. 1993. The impact of European divestment announcements on shareholder wealth: Evidence from the UK. *Journal of Multinational Financial Management* **2**: 185–208.

Pindyck RS. 1991. Irreversibility, uncertainty, and investment. *Journal of Economic Literature* **29**: 1110-1152.

Rangan, S. 1998. Do multinationals operate flexibly? Theory and evidence. *Journal of International Business Studies* **29**: 217-237.

Roth K, Morrison A. 1990. An empirical analysis of the integration-responsiveness framework in global industries. *Journal of International Business Studies* **21**: 541-564.

Rugman AM. 1979. *International Diversification and the Multinational Enterprise*. Lexington. Books, Lexington, MA.

Reuer JJ, Tong TW. 2010. Discovering valuable growth opportunities: An analysis of equity alliances with IPO firms. *Organization Science* **21**: 202-215

Tang C, Tikoo S. 1999. Operational flexibility and market valuation of earnings. *Strategic Management Journal* **20**: 749–761.

Therneau, TM., Grambsch, PM. 2000. *Modeling Survival Data: Extending the Cox Model*. Springer: New York, NY.

Tiwana A, Wang J, Keil M, Ahluwalia P. 2007. The bounded rationality bias in managerial valuation of real options: Theory and evidence from IT projects, *Decision Sciences* **38**: 157–181.

Tong TW, Reuer JJ. 2007. How do real options matter? Empirical research on strategic investments and firm performance, *Advances in Strategic Management* **24**: 145–173.

Tong TW, Reuer JJ, Peng MW. 2008. International joint ventures and the value of growth options, *Academy of Management Journal* **51**:1014-1029.

Tong TW, Li Y. 2011. Real options and investment mode: Evidence from corporate venture capital and acquisition. *Organization Science* **22**: 659-674.

Torneden R. 1975. *Foreign Divestment by U.S. Multinational Corporations: With Eight Case Studies*. Praeger: New York, NY.

UNCTAD. 2000. *World Investment Report 2000: Transnational Corporations, Market Structure and Competition Policy*. United Nations: New York.

Xu D, Zhou C, Phan PH. 2010. A real options perspective on sequential acquisitions in China. *Journal of International Business Studies* **41**: 166-174.

Vassolo RS, Anand J, Folta TB. 2004. Non-additivity in portfolios of exploration activities: A real options-based analysis of equity alliances in biotechnology. *Strategic Management Journal* **25**: 1045-1061.

Vivarelli M, Santarelli E. 2007. Entrepreneurship and the process of firms' entry, survival and growth, *Industrial and Corporate Change* **16**: 455–488.

TABLE 1A: Means, Standard Deviations, and Correlations for Full Sample[a, b]

	Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Subsidiary exit	0.10	0.31	1.00																	
2	Home coutnry GDP growth	3.93	6.47	-0.01	1.00																
3	Home country GDP per capita	10738.97	781.05	-0.06	-0.04	1.00															
4	Host country GDP growth	4.07	4.48	-0.13	-0.07	0.32	1.00														
5	Host country GDP per capita	6389.04	11204.93	-0.15	0.02	-0.03	0.48	1.00													
6	Cultural distance	1.97	0.91	0.11	0.03	-0.09	-0.44	-0.40	1.00												
7	Political risk/stability[b]	56.07	8.53	-0.08	0.00	-0.03	-0.2	0.34	0.37	1.00											
8	Advertising intensity	1.80	5.47	-0.01	-0.01	-0.03	-0.06	0.05	0.05	0.09	1.00										
9	R&D intensity	1.99	5.69	-0.01	-0.01	-0.03	-0.04	0.06	0.04	0.07	0.18	1.00									
10	Parent size	22.59	0.68	-0.03	-0.05	0.22	0.05	0.02	-0.06	0.05	0.12	0.11	1.00								
11	Parent debt-to-equity ratio	-17.18	88.40	0.01	0.02	0.01	-0.02	0.02	0.00	0.00	0.00	0.00	0.00	1.00							
12	International experience	7.53	2.60	-0.02	-0.02	0.37	0.33	0.19	-0.04	-0.09	0.00	0.00	0.08	0.01	1.00						
13	Subsidiary size	16.64	2.43	-0.25	0.09	-0.01	-0.23	0.16	0.04	0.02	0.03	0.06	0.10	0.02	0.19	1.00					
14	Expatriate ratio	0.14	0.25	-0.12	0.07	-0.11	-0.26	0.30	0.27	0.22	0.01	0.00	0.00	-0.04	0.02	-0.07	1.00				
15	Entry mode: WOS (1) vs. JV (0)	0.76	0.43	-0.02	0.03	0.07	-0.09	0.15	0.12	0.13	-0.01	-0.01	0.04	-0.01	0.08	-0.03	0.11	1.00			
16	Subsidiary ROA	-6.57	53.99	-0.39	0.00	0.04	0.09	-0.11	-0.07	-0.06	0.00	0.00	0.02	-0.07	0.01	0.20	-0.08	-0.05	1.00		
17	Change in the across-country (*versus* within-country) intra- and inter-firm sales	10.77	10.36	-0.03	-0.04	0.18	-0.08	0.07	-0.01	-0.03	0.28	0.16	0.27	-0.00	0.21	0.13	0.03	0.05	0.00	1.00	
18	Percentage of across-country (*versus* within-country) intra- and inter-firm sales	38.72	42.40	-0.07	0.02	0.02	0.12	-0.17	-0.14	-0.07	0.01	0.01	-0.07	-0.00	0.03	0.06	-0.04	0.10	0.04	0.06	1.00

[a] Correlations with an absolute value greater than .045 are significant at the .05 level.

[b] Correlations with industry fixed effects are not shown.

TABLE 1B: Means, Standard Deviations, and Correlations for High ROA Group[a, b]

	Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Subsidiary exit	0.09	0.30	1.00																	
2	Home coutnry GDP growth	3.97	6.52	-0.01	1.00																
3	Home country GDP per capita	10856.92	794.28	-0.06	-0.05	1.00															
4	Host country GDP growth	4.15	4.57	-0.03	-0.07	0.28	1.00														
5	Host country GDP per capita	6514.72	11360.45	-0.04	0.01	0.02	0.46	1.00													
6	Cultural distance	1.95	0.90	0.02	0.00	-0.05	-0.43	-0.40	1.00												
7	Political risk/stability[b]	55.72	8.73	-0.00	-0.03	0.04	-0.14	0.33	0.37	1.00											
8	Advertising intensity	1.97	7.59	-0.02	-0.01	-0.01	-0.05	0.06	0.05	0.11	1.00										
9	R&D intensity	2.19	7.89	-0.02	-0.01	-0.01	-0.03	0.07	0.04	0.09	0.19	1.00									
10	Parent size	22.64	0.65	-0.06	-0.06	0.23	0.04	0.05	-0.07	0.10	0.11	1.10	1.00								
11	Parent debt-to-equity ratio	-233.53	121.19	0.01	0.03	0.01	-0.02	0.02	0.01	0.00	-0.00	-0.01	-0.00	1.00							
12	International experience	7.66	2.59	-0.05	-0.01	0.37	0.37	0.23	0.01	-0.06	0.01	0.01	0.14	0.02	1.00						
13	Subsidiary size	17.22	2.24	-0.33	0.09	-0.06	-0.23	0.16	0.04	0.03	0.03	0.06	0.12	0.02	0.16	1.00					
14	Expatriate ratio	0.13	0.24	-0.09	0.08	-0.07	-0.26	0.32	0.28	0.24	0.00	0.00	-0.00	-0.05	0.06	-0.07	1.00				
15	Entry mode: WOS (1) vs. JV (0)	0.74	0.44	-0.05	0.02	0.07	-0.07	0.16	0.13	0.15	-0.01	-0.02	0.05	-0.01	0.07	-0.05	0.15	1.00			
16	Subsidiary ROA	6.21	30.18	-0.26	-0.03	0.01	-0.03	0.03	0.03	0.01	-0.02	-0.00	-0.00	-0.18	0.02	0.12	0.02	-0.09	1.00		
17	Change in the across-country (*versus* within-country) intra- and inter-firm sales	11.38	11.17	-0.05	-0.01	0.16	-0.13	0.12	0.00	0.01	0.40	0.13	0.29	-0.00	0.27	0.18	0.04	0.05	-0.01	1.00	
18	Percentage of across-country (*versus* within-country) intra- and inter-firm sales	38.30	41.92	-0.03	0.04	0.01	0.08	-0.14	-0.13	-0.08	0.02	0.02	-0.07	0.03	0.05	0.10	-0.02	0.07	0.02	0.06	1.00

[a] Correlations with an absolute value greater than .045 are significant at the .05 level.

[b] Correlations with industry fixed effects are not shown.

TABLE 1C: Means, Standard Deviations, and Correlations for Low ROA Group[a, b]

	Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Subsidiary exit	0.11	0.31	1.00																	
2	Home coutnry GDP growth	3.90	6.38	-0.01	1.00																
3	Home country GDP per capita	10624.63	778.21	-0.06	-0.04	1.00															
4	Host country GDP growth	3.99	4.41	-0.23	-0.07	0.34	1.00														
5	Host country GDP per capita	6259.24	11078.69	-0.26	0.03	-0.08	0.49	1.00													
6	Cultural distance	2.00	0.91	0.20	0.05	-0.12	-0.43	-0.42	1.00												
7	Political risk/stability	56.42	8.30	-0.16	0.03	-0.10	-0.14	0.35	0.37	1.00											
8	Advertising intensity	1.63	1.46	-0.05	-0.00	-0.19	-0.05	0.12	0.11	0.09	1.00										
9	R&D intensity	1.81	1.52	-0.05	-0.00	-0.18	-0.03	0.13	0.09	0.07	0.17	1.00									
10	Parent size	22.55	0.71	-0.00	-0.04	0.21	0.04	0.01	-0.05	0.00	0.36	0.32	1.00								
11	Parent debt-to-equity ratio	199.62	30.36	0.03	-0.02	0.00	-0.02	0.01	-0.02	0.01	0.11	0.11	0.02	1.00							
12	International experience	7.39	2.61	-0.02	-0.03	0.36	0.37	0.15	-0.08	-0.12	-0.01	-0.02	0.01	0.01	1.00						
13	Subsidiary size	16.02	2.48	-0.19	0.09	-0.00	-0.03	0.18	0.05	0.02	0.08	0.10	0.05	0.03	0.21	1.00					
14	Expatriate ratio	0.15	0.26	-0.14	0.05	-0.15	-0.29	0.28	0.25	0.20	0.02	0.02	0.01	-0.02	-0.01	-0.07	1.00				
15	Entry mode: WOS (1) vs. JV (0)	0.78	0.42	-0.01	0.03	0.08	-0.26	0.13	0.10	0.10	0.04	0.04	0.05	-0.02	0.10	0.02	0.07	1.00			
16	Subsidiary ROA	-19.36	65.79	-0.44	0.02	0.03	0.15	-0.18	-0.12	-0.09	0.00	-0.01	0.00	0.01	-0.01	0.18	-0.12	-0.02	1.00		
17	Change in the across-country (*versus* within-country) intra- and inter-firm sales	10.14	9.43	-0.00	-0.06	0.19	-0.04	0.03	-0.02	-0.08	0.18	0.29	0.25	0.02	0.15	0.07	0.02	0.05	-0.01	1.00	
18	Percentage of across-country (*versus* within-country) intra- and inter-firm sales	39.17	42.92	-0.12	-0.01	0.04	0.17	-0.20	-0.15	-0.07	-0.05	-0.06	-0.06	-0.02	0.00	0.03	-0.05	0.13	0.06	0.07	1.00

[a] Correlations with an absolute value greater than .045 are significant at the .05 level.

[b] Correlations with industry fixed effects are not shown.

TABLE 2: Results of Cox Proportional Hazard Models for Full Sample

	Full sample					
	Model 1		Model 2		Model 3	
	ß	S.E.	ß	S.E.	ß	S.E.
Home coutnry GDP growth	-0.101*	(0.045)	-0.103*	(0.049)	-0.113*	(0.049)
Home country GDP per capita	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)
Host country GDP growth	-0.368***	(0.029)	-0.366***	(0.030)	-0.366***	(0.030)
Host country GDP per capita	-0.0007***	(0.0001)	-0.0007***	(0.0001)	-0.0007***	(0.0001)
Cultural distance	0.277*	(0.130)	0.302*	(0.131)	0.303*	(0.131)
Political risk/stability[b]	-0.044***	(0.012)	-0.043***	(0.012)	-0.043***	(0.012)
Advertising intensity	-0.101	(0.141)	-0.107	(0.144)	-0.112	(0.145)
R&D intensity	-0.010	(0.024)	-0.006***	(0.001)	0.0004***	(0.0001)
Parent size	-0.500***	(0.116)	-0.673***	(0.105)	-0.673***	(0.105)
Parent debt-to-equity ratio	0.0005	(0.0004)	0.0005	(0.0004)	0.0004	(0.0004)
International experience	-0.300***	(0.033)	-0.298***	(0.033)	-0.298***	(0.033)
Subsidiary size	-0.256***	(0.022)	-0.251***	(0.022)	-0.249***	(0.023)
Expatriate ratio	-0.599**	(0.192)	-0.612***	(0.192)	-0.606**	(0.192)
Entry mode: WOS (1) vs. JV (0)	-0.187	(0.147)	-0.221	(0.148)	-0.219	(0.148)
Change in the across-country (*versus* within-country) intra- and inter-firm sales	-0.006	(0.004)	-0.006	(0.004)	-0.006	(0.004)
Subsidiary ROA	-0.004***	(0.0004)	-0.004***	(0.0004)	-0.004***	(0.0004)
Industry dummy	Included		Included		Included	
Percentage of across-country (*versus* within-country) intra- and inter-firm sales			-0.002	(0.002)	-0.007	(0.008)
Percentage of across-country (*versus* within-country) intra- and inter-firm sales^2					0.00004	(0.0001)
Number of observations	3,082		3,082		3,082	
Number of failures	305		305		305	
Wald χ^2	1008.403***		1013.336***		1013.743***	

* $p < .05$
** $p < .01$
*** $p < .001$.

TABLE 3: Results of Cox Proportional Hazard Models for Split Samples

	Section A: High ROA group						Section B: Low ROA group					
	Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	ß	S.E.	ß	S.E.	ß	S.E.	ß	S.E.	ß	S.E.	ß	S.E.
Home coutnry GDP growth	-0.109†	(0.066)	-0.122†	(0.071)	-0.133†	(0.071)	-0.086	(0.063)	-0.077	(0.067)	-0.088	(0.067)
Home country GDP per capita	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)
Host country GDP growth	-0.245***	(0.058)	-0.261***	(0.059)	-0.261***	(0.060)	-0.437***	(0.041)	-0.433***	(0.041)	-0.432***	(0.042)
Host country GDP per capita	-0.0004*	(0.0002)	-0.0005*	(0.0002)	-0.0005*	(0.0002)	-0.0008***	(0.0001)	-0.0008***	(0.0001)	-0.0008***	(0.0001)
Cultural distance	0.278	(0.215)	0.225	(0.216)	0.226	(0.216)	0.334†	(0.177)	0.399*	(0.182)	0.409*	(0.182)
Political risk/stability[b]	-0.012	(0.025)	-0.018	(0.025)	-0.018	(0.025)	-0.087***	(0.017)	-0.088***	(0.017)	-0.086***	(0.017)
Advertising intensity	-0.526*	(0.262)	-0.604*	(0.259)	-0.604*	(0.259)	-0.205	(0.263)	-0.234	(0.286)	-0.214	(0.289)
R&D intensity	-0.119†	(0.061)	-0.003	(0.002)	-0.0003**	(0.0001)	-0.047	(0.038)	-0.010***	(0.002)	-0.0005***	(0.0001)
Parent size	-0.455*	(0.201)	-0.499**	(0.183)	-0.496**	(0.184)	-0.491**	(0.166)	-0.384*	(0.159)	-0.395*	(0.160)
Parent debt-to-equity ratio	0.0001	(0.0005)	0.0004	(0.0015)	0.0003	(0.0016)	0.0003	(0.0004)	0.0001	(0.0004)	0.0001	(0.0004)
International experience	-0.271***	(0.076)	-0.247***	(0.077)	-0.247***	(0.077)	-0.282***	(0.045)	-0.275***	(0.045)	-0.275***	(0.045)
Subsidiary size	-0.081*	(0.038)	-0.069†	(0.039)	-0.068†	(0.039)	-0.170***	(0.031)	-0.160***	(0.031)	-0.150***	(0.032)
Expatriate ratio	-0.158	(0.332)	-0.085	(0.331)	-0.084	(0.331)	-0.561*	(0.260)	-0.610*	(0.261)	-0.588*	(0.261)
Entry mode: WOS (1) vs. JV (0)	-0.470*	(0.236)	-0.586*	(0.245)	-0.588*	(0.246)	-0.293	(0.193)	-0.243	(0.194)	-0.261	(0.195)
Change in the across-country (*versus* within-country) intra- and inter-firm sales	-0.010	(0.008)	-0.011	(0.008)	-0.011	(0.008)	-0.008	(0.005)	-0.007	(0.005)	-0.007	(0.005)
Subsidiary ROA	-0.143***	(0.008)	-0.145***	(0.009)	-0.145***	(0.009)	-0.004***	(0.0004)	-0.004***	(0.0005)	-0.004***	(0.0005)
Industry dummy	Included		Included		Included		Included		Included		Included	
Percentage of across-country (*versus* within-country) intra- and inter-firm sales			-0.005*	(0.002)	-0.029**	(0.010)			-0.011***	(0.002)	-0.053***	(0.012)
Percentage of across-country (*versus* within-country) intra- and inter-firm sales[2]					0.0001	(0.0001)					0.0005***	(0.0001)
Number of observations	1,619		1,619		1,619		1,463		1,463		1,463	
Number of failures	146		146		146		159		159		159	
Wald χ^2	465.718***		465.819***		467.036***		586.725***		592.993***		595.680***	

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$.

Figure 1. The shape of relationship between the percentage of across-country (*versus* within-country) intra- and inter-firm sales and exit likelihood

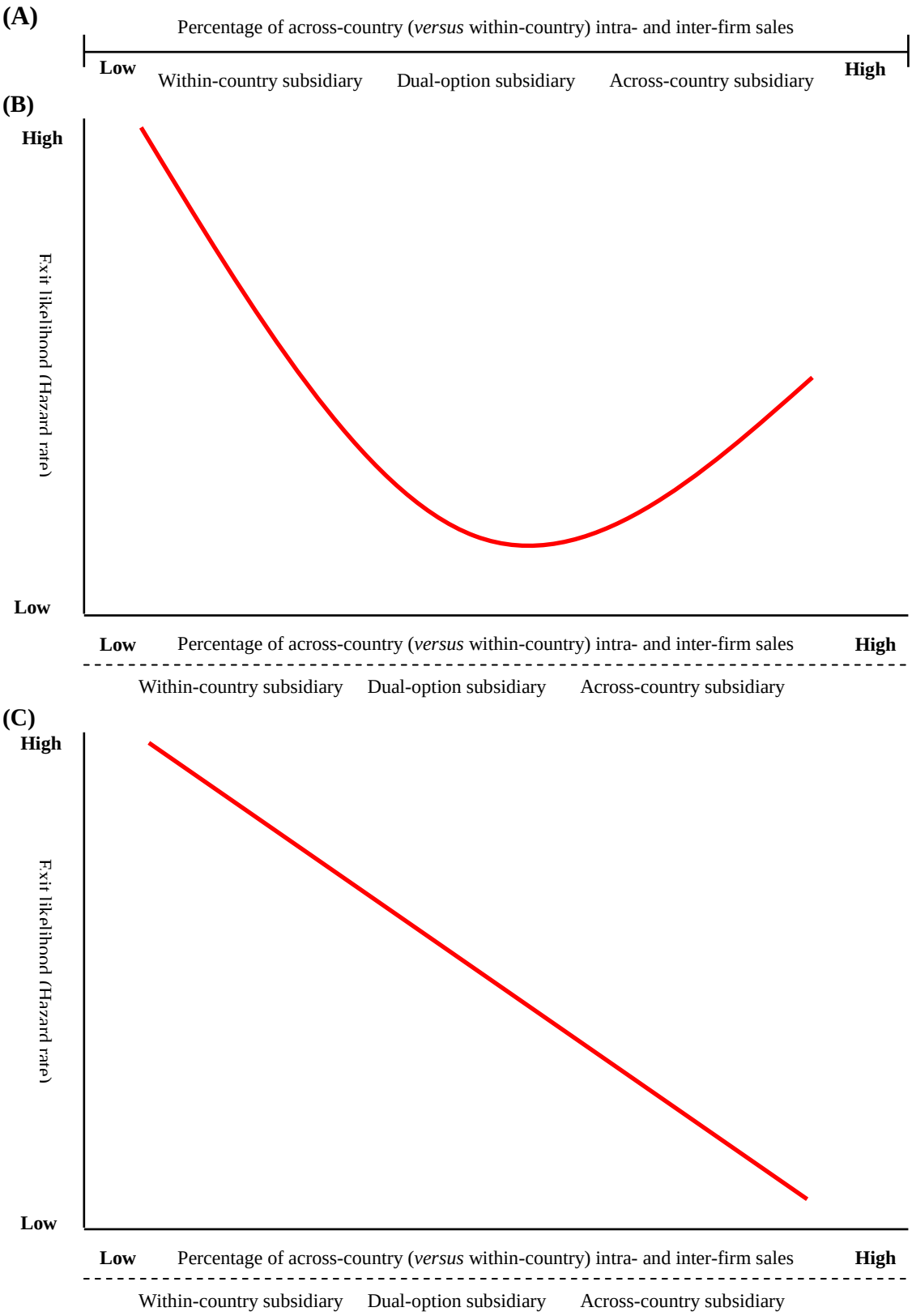

Figure 2. High ROA subsidiaries: The shape of relationship between the percentage of across-country (*versus* within-country) intra- and inter-firm sales and exit likelihood

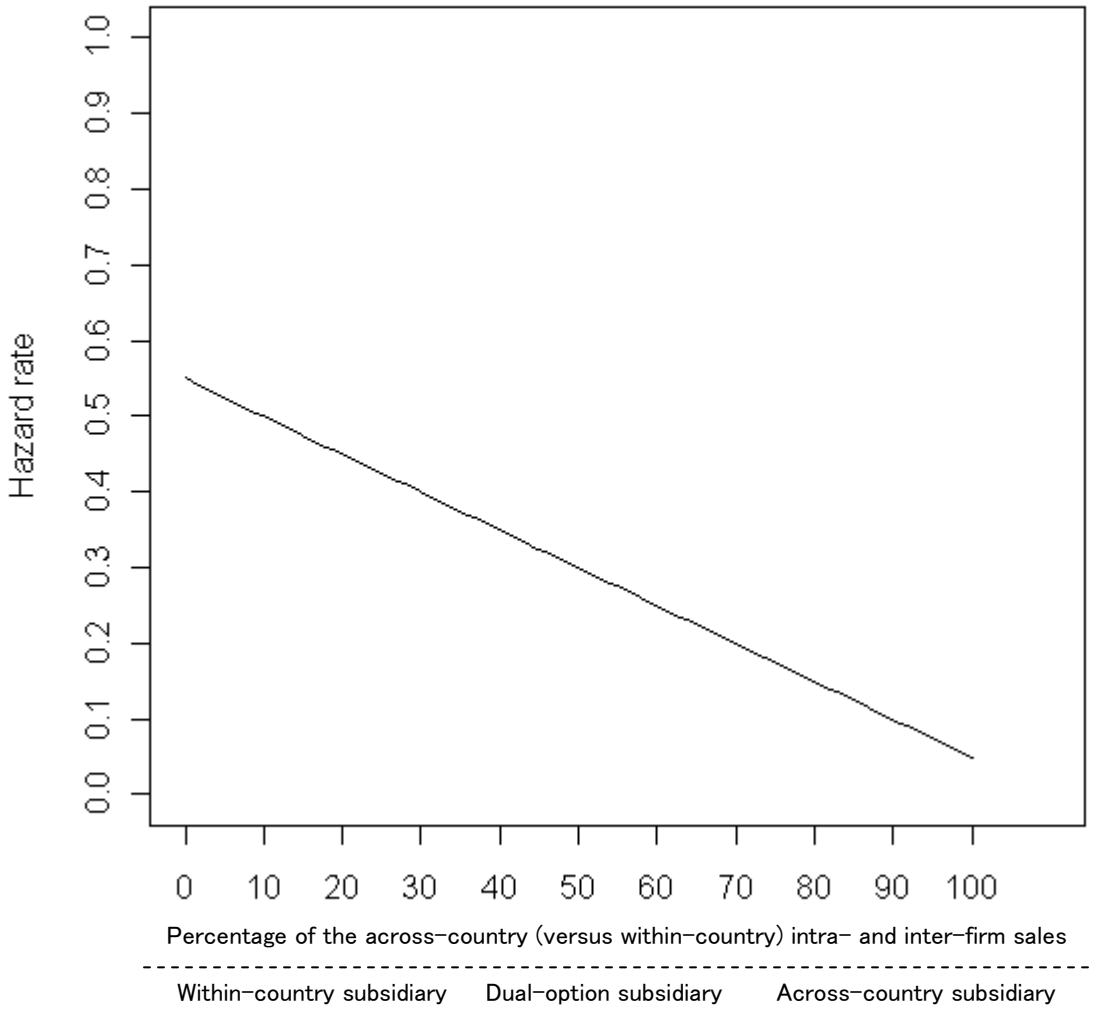
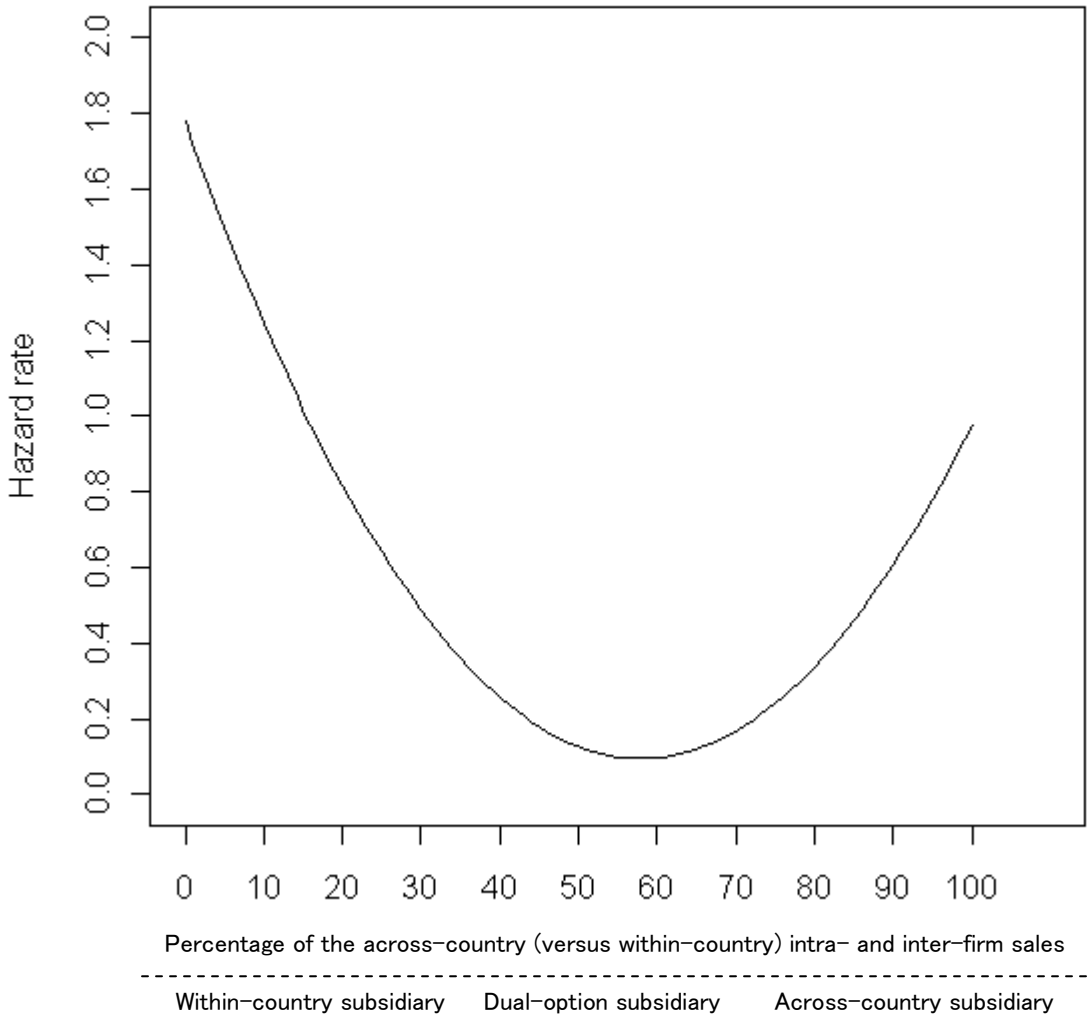
Figure 3. Low ROA subsidiaries: The shape of relationship between the percentage of across-country (*versus* within-country) intra- and inter-firm sales and exit likelihood