Do Joint Ventures Really Have Low Survival Rate?

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This paper investigates whether or not the survival rate of joint ventures (JV) is really lower than other entry modes. In order to answer this question there is a need to recognize different types of firm exit, levels of ownership equity and types of JV. A sample of 224 manufacturing subsidiaries established by Japanese companies in Brazil over 1989-2003 is used for empirical analysis. A test of equality of survival functions across entry modes (log rank test) and the proportional hazard model implemented in Cox regression are applied to analyze the proposed hypotheses. The findings showed that traditional international joint ventures (TIJV) are more likely to be exited than wholly-owned subsidiaries (WOS). However, the high exit rate is due to capital divestment, not firm liquidation. By considering different types of JV, the results suggest that joint ventures formed only among home-country partners are less likely to be exited (firm divestment) than TIJV. When taken into consideration different levels of ownership equity for JV, the results revealed that only Minority-owned TIJV obtained a higher likelihood of divestment than other entry modes. In addition, there are some firms’ characteristics that make impact on the longevity of international subsidiary. Based on all these findings, this study provide evidence for a need to distinguish types of firm exit, levels of ownership, types of JV, and include some firm characteristics and industry indicator when examining survival of overseas subsidiaries. The results should lead to misinterpretations when these important points are not taking into account in the survival analysis.

1. Introduction

When multinational companies (MNCs) decide to make an international investment in a particular country, there are many points to take into consideration before accessing the market. But one important decision is the entry mode selection. Past studies have adopted a large number of theoretical approaches to explain the entry choice made by foreign investors, such as transaction cost theory (Williamson, 1985; Anderson and Gatignon, 1986; Gatignon and Anderson, 1988; Hennart, 1988), eclectic paradigm (Dunning, 1977, 1980, 1988), effect of national culture (Kogut and Singh, 1988), international experience (Erramilli, 1991; Aulakh and Kotabe, 1997), resource-based theory (Erramilli, Agarwal, and Dev, 2002; Ekeledo and Sivakumar, 2004), and institutional theory (Erramilli, 1996; Pan, 2000, Yiu and Makino, 2002). These studies have provided a great contribution to the international business literature by examining the pre-entry decision process.

The focus of this paper refers to the investigation of the post-entry process, more specifically investigating the achieved performance after accessing the foreign market. Performance data of foreign subsidiaries that involves economic measures (i.e. profitability ratio) are quite difficult to obtain as multinational corporations usually release consolidated company information. A way to measure subsidiary performance is the adoption of company survival rate.

Empirical research related to entry mode and survival of international investment made by multinational companies has received considerable attention from scholars. Previous
studies suggested that joint ventures (JV) have a very high failure rate (Kogut, 1989; Makino and Beamish, 1998). However, prior research focused on this issue solely for JV and considered exits by either divestment or dissolution, which provided some misinterpretations of the results. Hennart et al. (1998) suggested taking into consideration level of ownership – wholly-owned subsidiary (WOS) or JVs – and type of exit – sale or liquidation – when analyzing firm longevity. Furthermore, Dhanaraj and Beamish (2004) provided empirical evidence to the importance of considering different ownership levels of JVs when investigating firm survival.

Although both studies provided significant contribution on the understanding of the survival of overseas subsidiaries, there are still some questions for further investigation. Do joint ventures really have lower longevity rate than other entry modes? Are there differences between the likelihood to exit (i.e. liquidation or divestment) within different types of JV equity ownership? While Hennart et al. (1998) found that the higher dissolution rate for JV is associated with divestment and not with liquidation, they have not distinguished the equity ownership of JV. As Dhanaraj and Beamish (2004) pointed out, there is a need to disaggregate JV than considering a wide range of organizational arrangements under a single umbrella of JV. Dhararaj and Beamish (2004) compared exit rates using different level of JV equity ownership, however they did not provided any distinction between types of exit. The present study addresses to answer these questions and offers further evidence by considering other firm characteristics and industry indicator in the survival analysis.

Therefore, this paper extends previous studies by examining the survival of MNCs subsidiaries in a foreign market while recognizing different types of JV, firm exit, and JV equity ownership. While prior studies have examined these issues separately, in fact none has covered these points simultaneously.

### 2. Factors influencing survival and hypotheses

#### 2.1. Entry mode

A number of empirical researches provided evidence of the importance of entry mode choice for firm survival (Li, 1995; Gomes-Casseres, 1987). Prior studies have investigated JV on the subject of instability (Yamawaki, 1997), partnership conflict (Killing, 1983), and demonstrated that JV presents a very high failure rate comparing to WOS (Kogut, 1989; Li, 1995; Yamawaki, 1997). As noted by Hennart et al. (1998), previous studies have not made any distinction between types of firm exit. For that reason, it is important to see whether or not the apparently higher termination rate of JV is due to a higher rate of divestment or to a higher rate of liquidation. In addition, generally past investigations have taken into consideration JV formed between foreign and local firms. However, as pointed out in the studies developed by Makino and Beamish (1998) and Ogasavara and Hoshino (2007), other types of JV exist, particularly for Japanese subsidiaries. Moreover, Dhararaj and Beamish (2004) showed the advantage from clearly considering the impact of equity level in international joint venture (IJV). They found that firm exit rates are high at very low equity levels, and as the equity increases, the dissolution rate decreased drastically. Hence, this study considers entry mode selection based on this classification:

- **Wholly-owned subsidiaries (WOS)** – one Japanese parent firm holds at least 95% of the subsidiary equity.
- **Traditional international joint ventures (TIJV)** - formed between Japanese partner(s) and local partner(s), and taking into consideration the equity ownership, it can be classified as:
  - **Majority-owned TIJV** – formed between Japanese partner(s) and local partner(s). One Japanese parent firm holds at least 51% and no more than 95% of the subsidiary equity;
Co-owned TIJV – formed between a Japanese partner and a local partner. One Japanese parent firm holds 50% of the subsidiary equity;

Minority-owned TIJV – formed between Japanese partner(s) and local partner(s). One Japanese parent firm holds at least 5% and no more than 50% of the subsidiary equity;

Japanese-Japanese joint ventures (JJ-JV) - formed only among Japanese partners. When considering the equity ownership based on partner affiliation, it can be classified as:

Affiliated JJ-JV – formed by affiliated Japanese partners, which means that companies have strong alliance with each other and share close financial or buyer-supplier relationships in the same conglomerate group (keiretsu). One Japanese parent firm holds 5% and no more than 95% of the subsidiary equity;

Unaffiliated JJ-JV – formed by unaffiliated Japanese partners, in other words, companies without any conglomerate relationship. One Japanese parent firm holds 5% and no more than 95% of the subsidiary equity;

Doing business abroad involves more difficulties than at home-country market, because firms face uncertainty and are subject to the liability of foreignness (Hymer, 1976). On one hand, at the moment that MNCs chose to enter a foreign market through TIJV, it can be an opportunity and effective strategy for gaining local partner’s knowledge about the local practices, consumer tastes, institutional framework, and avoid costly mistakes in the new environmental. This means that TIJV allows foreign investors to better adapt to the host country than doing it alone through WOS, resulting in fewer liquidation that is comparable to that of WOS (Hennart et al., 1998). On the other hand, TIJV should face management difficulties and conflict among partners (Killing, 1983) that should lead the foreign partner to sell more quickly its stake to his partner or to other firm than those in WOS (Hennart et al., 1998), thus it is expected by considering two types of firm exit (i.e. liquidation or divestment):

H1a: TIJV are more likely to be divested than WOS.

H1b: The likelihood of subsidiary liquidation is similar between TIJV and WOS.

TIJV differs in terms of degree of control exerted by the foreign partner. According to Dhanaraj and Beamish (2004), the organizational dynamic of having minority equity ownership position differs a lot from that of majority equity ownership. They suggested that minority equity ownership may exist only for exploratory purposes and possibly for taking advantages of the local tax structure. While the majority equity ownership, may exist to accommodate some specific short-term objectives, thus:

H2a: Minority-owned TIJV are more likely to be divested than high equity ownership level firms.

Following the assumptions made on H1b, the effect of equity ownership of TIJV does not hold for firm liquidation, thus:

H2b: The likelihood of subsidiary liquidation is similar between Minority-owned TIJV and high equity ownership level firms.

Joint ventures formed among partners from the same home-country have the benefit to share similar organization cultures, they are more likely to have had dealings with one another, and they are less likely to misunderstand each other (Hennart and Zeng, 2002). Hence, the rate of JJ-JV firm liquidation and capital divestment is comparable to that of WOS:

H3: The likelihood of subsidiary liquidation and divestment is similar between JJ-JV and WOS.

According to Makino and Beamish (1998), the cultural distance level among Japanese partner in JJ-JV is lower than TIJV, and they suggested that JVs with similar national cultures have higher survival rates than JV between dissimilar cultures. Considering the assumption of
the similarities between JJ-JV and WOS in terms of rate of firm liquidation and firm divestment made in H3, and based on the assumptions proposed in H1a and H1b, thus:

**H4a:** JJ-JV is less likely to be divested than TIJV.

**H4b:** The likelihood of subsidiary liquidation is similar between JJ-JV and TIJV.

When Japanese partners are affiliated firms, it is assumed that partners have the benefit to belong to the same network, share similar organization cultures, and exchange both tangible and intangible resources (Makino and Beamish, 1998), thus:

**H5:** The likelihood of subsidiary liquidation and divestment will be higher for Unaffiliated JJ-JV than for Affiliated JJ-JV.

Although the aim of this study refers to answer the research question related to entry mode (i.e. JV) and firm survival, there is a need to offer further evidence by taking into account other factors that might impact the longevity of subsidiaries. In this sense, firm characteristics and industry indicator are considered for survival analysis.

### 2.2. Subsidiary firm characteristics

Past researches have found a positive relationship between subsidiary firm size and the likelihood of survival (Mata et al., 1995; Dhanaraj and Beamish, 2004). Large investment is a characteristic of a parent firm with large resource endowments. It also involves more managerial attention and considerable commitment of a parent firm to its subsidiary (Dhanaraj and Beamish, 2004):

**H6:** Subsidiaries of large size are less likely to be liquidated and to be divested than subsidiaries of small size.

When examining the effect of firm diversification on firm survival, previous studies have found that unrelated units are more likely to exit than subsidiaries operating in the same activity as the parent firm (Li, 1995; Yamawaki, 1997). In general, when foreign companies invested abroad in the same activity, the parent firms are more likely to possess skills, resources and intangible assets that can be transferred to the subsidiaries (Li, 1995):

**H7:** Subsidiaries which diversify from the parent firm activity are more likely to be liquidated and to be divested than those subsidiaries in the same activity as the parent firm.

### 2.3. Parent firm characteristics

According to Delios and Beamish (1999), a parent firm size has a positive relationship with exit rate. This could be potentially due to the flexibility that large firms enjoy in moving their subsidiaries. In addition, large firms are probably less reluctant to divest their capital, because a given subsidiary is less important to a large MNC than to a small parent firm (Hennart et al., 1998), thus:

**H8:** Subsidiaries with a large parent firm are more likely to be divested and to be liquidated.

A parent firm’s experience in the target market is critical for international expansion (Davidson, 1980), and consequently can have significant effects on performance of foreign subsidiaries (Johanson and Vahlne, 1977). This experience is time-consuming and can be learned only through learning-by-doing. Hence, the accumulation of parent firm experience helps firms to increase know-how of doing business in the local market (Johanson and Vahlne,
1977), leads to reduce operational uncertainties (Davidson, 1980), and should reflect on firm survival, thus:

\[ H9: \text{The longer the parent firm has been operating in the local market, the less likely that it will be liquidated or to be divested}. \]

2.4. Control Variables

Furthermore, Mata and Portugal (1994) found a positive and significant effect of industry growth upon the survival. Industries which are growing quickly are likely to be a good environment for firms, leading to increased sales and enhanced performance, and hence the probability of liquidation is lower. On the other hand, the probability to be divested is more ambiguous, since high growth may create opportunities to sell off a stake to another firm (Hennart et al., 1998):

\[ H10: \text{Subsidiaries in growing industries are less likely to be liquidated}. \]

3. Methodology

3.1. Data and Sample


Data for the Japanese parent firms for each subsidiary were compiled using 1990 to 2004 editions of *Nikkei Kaisha Nenkan: Jyoujyou Kaishaban* (Nikkei Annual Corporation Report: Listed Companies) and *Nikkei Soukan: Mijyoujyou Kaishaban* (Nikkei Annual Report: Unlisted Companies).

Data for subsidiary type of exit (liquidation or divestment) were obtained through annual report of parent and subsidiary firms, and through numerous telephone and email inquires to existing subsidiaries which have the same parent firm, or the same local or Japanese partner.

Subsidiaries listed in the directory but with Japanese equity of less than 5 percent were removed as they were treated as portfolio investments (Dhanaraj and Beamish, 2004). In addition, those subsidiaries that did not report the founding date or the equity ownership were deleted from the sample. Using those selection criteria and considering complete data for all independent variables used in this study, from the original sample of 273 manufacturing subsidiaries, the sample was reduced to 224 cases (see Table 1).

<table>
<thead>
<tr>
<th>Entry Mode</th>
<th>Firm Survival</th>
<th>Firm Liquidation</th>
<th>Firm Divestment</th>
<th>Total</th>
</tr>
</thead>
</table>

Table 1 – Sample Distribution
3.2. Dependent Variable

Following Hennart et al. (1998), the dependent variable is the duration (in years) of a Japanese manufacturing subsidiary in Brazil. For exit case, the duration is the difference between the ending (exit) year and the starting (establishment) year. Subsidiary that continues to survive at the end of the observation is treated as censored case, which is the number of years between establishment in Brazil and the cutoff year (2003). Two types of exits are considered, liquidation and divestment. Liquidation means that subsidiary was closed, liquidated, or went bankrupt. While divestment means that the Japanese partner sold a stake to either the local partner firm or a third partner, and there is no more equity ownership of Japanese investment in this subsidiary.

3.3. Independent Variables

3.3.1. Entry mode

- **Traditional international joint ventures (TIJV)** - dummy variable which takes the value of “1” if the subsidiary is TIJV, and “0” otherwise. In addition, it was considered the foreign equity ownership:
  - **Majority-owned TIJV** – dummy variable which takes the value of “1” if the Japanese partner equity in the TIJV is greater than 51% but less than 95%.
  - **Co-owned TIJV** – dummy variable which takes the value of “1” if the Japanese partner equity in the TIJV is equals to 50%.
  - **Minority-owned TIJV** – dummy variable which takes the value of “1” if the Japanese partner equity in the TIJV is greater than 5% but less than 50%.

- **Japanese-Japanese joint ventures (JJ-JV)** - dummy variable which takes the value of “1” if the subsidiary is JJ-JV, and “0” otherwise. In addition, it was considered the Japanese partner affiliation:
  - **Affiliated JJ-JV** – dummy variable which takes the value of “1” if the JJ-JV is formed by affiliated home-country firms.
  - **Unaffiliated JJ-JV** – dummy variable which takes the value of “1” if the JJ-JV is formed by unaffiliated home-country firms.
3.3.2. Subsidiary firm characteristics

- **Subsidiary firm size** – For exited firm, it is the logarithm of the number of subsidiary employees at the time of liquidation or divestment. For censored case, it is the logarithm of the number of subsidiary employees in the cutoff year (2003). Mata *et al.* (1995) have found that models using current size are better predictors of survival than those including start-up size.

- **Subsidiary firm diversification** – Dummy variable which takes the value of “1” if the subsidiary is a diversification from the parent’s main line of business, and “0” otherwise.

3.3.3. Parent firm characteristics

- **Parent firm size** - For exited firm, it is the logarithm of the number of parent employees at the time of liquidation or divestment. For censored case, it is the logarithm of the number of parent employees in the cutoff year (2003).

- **Parent firm local experience** – For exited firm, it is the logarithm of the number of years between a Japanese parent’s first entry into Brazil and the year that the parent sold or liquidate its stake in that affiliate. For censored case, it is the logarithm of the number of years between a Japanese parent’s first entry into Brazil and the cutoff year (2003).

3.3.4. Control variables

- **Industry growth rate** - Data on the annual industry growth rate were obtained from IPEADATA online. IPEADATA is a database on Brazilian economy compiled and maintained by the Institute of Applied Economic Research (Instituto de Pesquisa Econômica Aplicada – IPEA) with more than 2,500 Brazilian macroeconomic time series accessible through the internet. For exited firm, the variable is computed using the average annual real growth rate from the previous year of the subsidiary entry to the year of the firm’s liquidation or divestment. For survivor firm, it is the average annual real growth rate from the previous year of the subsidiary entry to 2003. One year-lag from the subsidiary entry was chosen because the assumption that managerial decisions are based on information from previous year (Hennart *et al*., 1998).

3.4. Model

Following Hennart *et al.* (1998) and Dhanaraj and Beamish (2004), this paper adopt the proportional hazard model implemented in Cox Regression (Cox and Oakes, 1984) to adjust the problems of censoring data and aging effects, and consequently quantify the impact of independent variables on the survival of the subsidiary. The Cox regression model is written in terms of the hazard function (exit rate at time t), which indicates how likely a case is to experience an event given that the case has survived to that time (Norusis, 2004):

\[
h(t) = \left[ h_0(t) \right] e^{(\beta_1 x_1 + \ldots + \beta_k x_k)}
\]

(1)

where \( h_0(t) \) is a baseline function of survival time and depends only on time, while \( \beta_1 x_1 + \ldots + \beta_k x_k \) depends only on the values of the covariates and the regression coefficients.

4. Results

4.1. Test of equality of survival function
In order to test for the differences in the survival functions due to entry mode, the log rank test was performed (Perez et al., 2004). The log rank test is based on computing the weighted difference between the observed and expected number of exits at each of the time points. This test evaluates the null hypothesis that in the population, two or more survival functions are equal (Norusis, 2004). Three different survival functions were defined:

1. Termination <Test A>, which considered a firm exit due to either liquidation or to divestment, while treating survivor firms as censored cases;

2. Firm Liquidation <Test B> is termination due to liquidation or closure, while considering firm survival and firm divestment as censored cases;

3. Firm Divestment <Test C> is termination through capital divestment, while treating firm survival and firm liquidation as censored cases.

According to the results displayed in Table 2 and based on the sample distribution in Table 1, Test A showed a significant difference between the survival rate of TIJV and WOS, which means that TIJV is more likely to exit than WOS. In addition, when controlling for levels of equity ownership in TIJV, there is a statistically significant difference between Minority-owned TIJV with WOS and Majority-owned TIJV. This implies that small ownership levels have higher mortality rate than high ownership level of TIJV. These results confirm previous empirical studies that have not distinguished between exits due to liquidation and divestment (Li, 1995; Yamaki, 1997; Dhanaraj and Beamish, 2004). Furthermore, a statistically significant difference was found between JJ-JV and TIJV, which reinforces the importance of recognizing other types of JV (Makino and Beamish, 1998; Ogasavara and Hoshino, 2007).

Test B gives the results for Firm Liquidation, and none of the relationship revealed to be statistically significant, suggesting that the likelihood of a firm exit by liquidation is similar for all entry modes. Hence, H1b, H2b, H3, H4b are supported, while H5 is not supported. In addition, the results confirmed the importance to distinguish between two types of firm exits, because they have different determinants and implications.

When exit is due to Firm Divestment (Test C) significant differences exist between TIJV with WOS and JJ-JV. This indicated that the likelihood of a firm divestment will be higher for TIJV than for WOS, which is consistent with the findings of Hennart et al. (1998). In addition, TIJV has higher divestment rate than JJ-JV. This finding provides strong evidence to differentiate JV formed between foreign and local partners, from JV formed between partners from the same country (Makino and Beamish, 1998; Ogasavara and Hoshino, 2007). Therefore, H1a and H4a are supported. When controlling for equity ownership level of TIJV, the output revealed that only Minority-owned TIJV has impact on firm divestment. It implies that Minority-owned TIJV is more likely to be divested than subsidiaries with high level of ownership equity, supporting H2a. Furthermore, this provides evidence for the need to disaggregate TIJV rather than consolidating it under a single umbrella of TIJV (Dhanaraj and Beamish, 2004). The results did not support H5, where the probability of a firm liquidation showed no significant difference between Affiliated JJ-JV and Unaffiliated JJ-JV.
Table 2 – Test of equality of survival function across entry modes

<table>
<thead>
<tr>
<th>Categories of Entry Mode</th>
<th>TEST A Termination$^a$ Log Rank</th>
<th>TEST B Firm Liquidation$^b$ Log Rank</th>
<th>TEST C Firm Divestment$^c$ Log Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOS x TJIV</td>
<td>7.18*** (0.007)</td>
<td>1.24 (0.265)</td>
<td>29.33*** (0.000)</td>
</tr>
<tr>
<td>WOS x JJ-JV</td>
<td>0.05 (0.824)</td>
<td>0.00 (0.993)</td>
<td>0.88 (0.348)</td>
</tr>
<tr>
<td>TJIV x JJ-JV</td>
<td>7.48*** (0.006)</td>
<td>0.56 (0.452)</td>
<td>21.23*** (0.000)</td>
</tr>
<tr>
<td>ALL GROUP</td>
<td>10.46*** (0.005)</td>
<td>1.14 (0.566)</td>
<td>48.23*** (0.000)</td>
</tr>
<tr>
<td>WOS x Maj-own. TJIV</td>
<td>0.00 (0.978)</td>
<td>0.15 (0.700)</td>
<td>1.24 (0.265)</td>
</tr>
<tr>
<td>WOS x Co-own. TJIV</td>
<td>0.66 (0.414)</td>
<td>0.63 (0.428)</td>
<td>0.04 (0.847)</td>
</tr>
<tr>
<td>WOS x Min. TJIV</td>
<td>11.70*** (0.001)</td>
<td>1.24 (0.266)</td>
<td>42.03*** (0.000)</td>
</tr>
<tr>
<td>WOS x Affil. JJ-JV</td>
<td>0.02 (0.900)</td>
<td>0.04 (0.834)</td>
<td>0.31 (0.580)</td>
</tr>
<tr>
<td>WOS x Unaffil. JJ-JV</td>
<td>0.15 (0.698)</td>
<td>0.07 (0.789)</td>
<td>0.58 (0.448)</td>
</tr>
<tr>
<td>Maj-own. TJIV x Co-own. TIJV</td>
<td>0.45 (0.503)</td>
<td>0.27 (0.605)</td>
<td>0.18 (0.669)</td>
</tr>
<tr>
<td>Maj-own. TJIV x Min-own. TIJV</td>
<td>4.18** (0.040)</td>
<td>0.02 (0.895)</td>
<td>6.46** (0.011)</td>
</tr>
<tr>
<td>Maj-own. TJIV x Affil. JJ-JV</td>
<td>0.11 (0.745)</td>
<td>0.21 (0.648)</td>
<td>1.09 (0.296)</td>
</tr>
<tr>
<td>Maj-own. TJIV x Non-affil.JJ-JV</td>
<td>0.01 (0.942)</td>
<td>0.01 (0.909)</td>
<td>2.00 (0.157)</td>
</tr>
<tr>
<td>Co-own. TIJV x Min-own. TIJV</td>
<td>1.25 (0.263)</td>
<td>0.40 (0.528)</td>
<td>0.85 (0.356)</td>
</tr>
<tr>
<td>Co-own. TIJV x Affil.JJ-JV</td>
<td>0.54 (0.462)</td>
<td>0.54 (0.462)</td>
<td>#</td>
</tr>
<tr>
<td>Co-own. TIJV x Unaff. JJ-JV</td>
<td>0.40 (0.525)</td>
<td>0.40 (0.525)</td>
<td>#</td>
</tr>
<tr>
<td>Min-own. TJIV x Affil. JJ-JV</td>
<td>4.62** (0.031)</td>
<td>0.85 (0.357)</td>
<td>8.58*** (0.003)</td>
</tr>
<tr>
<td>Min-own. TJIV x Unaff. JJ-JV</td>
<td>9.07*** (0.002)</td>
<td>0.42 (0.516)</td>
<td>15.42*** (0.000)</td>
</tr>
<tr>
<td>Affil.JJ-JV x Unaffil. JJ-JV</td>
<td>0.13 (0.722)</td>
<td>0.13 (0.722)</td>
<td>#</td>
</tr>
<tr>
<td>ALL GROUP</td>
<td>18.56*** (0.002)</td>
<td>1.67 (0.893)</td>
<td>71.11*** (0.000)</td>
</tr>
</tbody>
</table>

Notes: $^a$ 224 total number of cases, 66 Termination, 158 censored cases. $^b$ 224 total number of cases, 43 Firm Liquidation, 181 censored cases. $^c$ 224 total number of cases, 23 Firm Divestment, 201 censored cases. Significance level at parenthesis; # no value; *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level;

4.2. Cox regression

The focus of this study is not limited to the evaluation of the differences in the survival functions among categories of entry mode, but it intends to assess the influence of covariates on the probability of firm survival. Hence, the proportional hazards Cox model was performed. Although not reproduced in this paper, the correlation among the independent variables was verified, of which the coefficients were low. In addition, variance inflation factor (VIF) for possible signs of multicollinearity. None of the VIF scores was above two, indicating that multicollinearity should not be a problem with these data. In addition, the proportional hazard assumption was tested with a time-dependent covariate and by examining the martingale residuals (Norusis, 2004). Both tests supported the assumption that the hazards are proportional between entry modes.

Table 3 shows the results of proportional hazards model estimates for Termination (Model 1 and 2), Firm Liquidation (Model 3 and 4), and Firm Divestment (Model 5 and 6), and as noted in the chi-square coefficient associated with each mode, all of them are significant at 0.01 level. The difference between the first and second models in each classification, is being
compared to WOS (reference category), and the first model includes entry modes as IJV, JJ-JV, while the second model considers the equity ownership levels of TIJV (Majority-owned TIJV, Co-owned TIJV, Minority-owned TIJV) and affiliation of JJ-JV (Affiliated JJ-JV and Unaffiliated JJ-JV).

As expected and coherent with earlier statistical test (Table 1), TIJV is positive and significant in models 1 and 5 indicating that TIJV has a higher level of termination rate than WOS, which is consistent with previous studies (Li, 1995; Yamawaki, 1997). However, the findings showed that the higher likelihood to a firm exit is due to capital divestment, but not to a firm liquidation, confirming the results obtained from Hennart et al. (1998) study. Hence, this result supported H1a and H1b. On the other hand, the output in models 2, 4 and 6 also revealed that it is dangerous to interpret that all types of TIJV have the same likelihood to be divested, but it holds for a firm liquidation supporting H2a. When controlling for equity ownership of TIJV, the findings showed that comparing to WOS, only Minority-owned TIJV is more likely to be terminated by capital divestment, while Majority-owned TIJV and Co-owned TIJV revealed no statistical difference. This provided support for H2b. Hence, the previous studies on a firm survival that have not distinguished different types of a firm exit (i.e. liquidation and divestment) and different types of equity ownership of TIJV, should present misinterpretations of the results.

The coefficients of JJ-JV exhibited no significant difference, which means that the likelihood to be liquidated or divested is similar between JJ-JV and WOS, supporting H3. This suggests that the advantage to share JV ownership with partners of the same culture background is a good strategy to achieve higher likelihood of survival.

With regards to other variables that should affect a firm survival, the coefficient of subsidiary firm size is negative and significantly associated with a firm liquidation, suggesting that small subsidiaries are more likely to be liquidated. This indicates that size of the subsidiary is a relevant characteristic that affect its ability to compete and survive. On the other hand, large subsidiaries seem to be more likely to be divested, but the coefficient is not significant, which partially supported H6. This could be potentially due to the high number of Minority-owned TIJV in this sample which has the characteristics to hold minority stakes in large subsidiaries as a diversification strategy (Blomstrom and Zejan, 1989).

The output for subsidiary firm’s diversification is negative and significant for all models, indicating that subsidiaries which diversify into different products from their parents are less likely to survive, in other words, more likely to be liquidated or to be divested. The result is consistent with previous researches (Li, 1995; Yamawaki, 1997), and provided support for H7.

As expected, the a coefficient of parent firm size is positive and significant for all models, which means that subsidiaries with large Japanese parents are more likely to be divested and to be liquidated, supporting H8. Large parent firms enjoy the flexibility to shift subsidiaries to new locations within a country (Delios and Beamish, 1999).

The output of parent firm’s local experience revealed in all models a negative and significant effect on subsidiary survival, providing support for H9. It means that having a longer presence in the local market allows the firm to interact with a variety of workers, customers, suppliers, which helps the firm to learn more about the host country, to develop more capabilities (Makino and Delios, 1996), and to increase know-how of doing business in the market (Johanson and Vahlne 1977), and consequently it reflects on higher rate of survival.

Industry growth has a negative and significant effect in Termination and Firm Liquidation, indicating that firms are less likely to exit through liquidation from a growing
market, consistent with Hennart et al. (1998). Hence, it supported H10.

Table 3 – Result of Cox regression (+ = shorter life)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Termination Model 1</th>
<th>Termination Model 2</th>
<th>Firm Liquidation Model 3</th>
<th>Firm Liquidation Model 4</th>
<th>Firm Divestment Model 5</th>
<th>Firm Divestment Model 6</th>
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<td>Entry Mode</td>
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<tr>
<td>Traditional International JV</td>
<td>0.711**</td>
<td>-0.318</td>
<td>2.802***</td>
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<tr>
<td></td>
<td>(6.039)</td>
<td>(0.574)</td>
<td>(12.214)</td>
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<tr>
<td>Majority-owned TJV</td>
<td>-0.190</td>
<td>-0.358</td>
<td>1.068</td>
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<tr>
<td></td>
<td>(0.106)</td>
<td>(0.271)</td>
<td>(0.689)</td>
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<tr>
<td>Co-owned TJV</td>
<td>-11.695</td>
<td>-12.118</td>
<td>-12.994</td>
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<tr>
<td></td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.000)</td>
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<tr>
<td>Minority-owned TJV</td>
<td>1.112***</td>
<td>-0.112</td>
<td>3.167***</td>
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</tr>
<tr>
<td></td>
<td>(12.884)</td>
<td>(0.053)</td>
<td>(15.511)</td>
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<tr>
<td>Japanese-Japanese JV</td>
<td>0.046</td>
<td>0.325</td>
<td>-11.235</td>
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<td></td>
<td>(0.016)</td>
<td>(0.743)</td>
<td>(0.002)</td>
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<tr>
<td>Affiliated JJ-JV</td>
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<td>0.468</td>
<td>-11.843</td>
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<td></td>
<td>(0.082)</td>
<td>(0.796)</td>
<td>(0.000)</td>
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<tr>
<td>Unaffiliated JJ-JV</td>
<td>0.035</td>
<td>0.250</td>
<td>-11.338</td>
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<td>(0.006)</td>
<td>(0.309)</td>
<td>(0.001)</td>
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<tr>
<td>Subsidiary firm size</td>
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<td>0.251</td>
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<td>(0.800)</td>
<td>(3.556)</td>
<td>(1.792)</td>
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<tr>
<td>Subsidiary firm diversification</td>
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<td>-1.086***</td>
<td>-1.719***</td>
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<td>(17.244)</td>
<td>(9.356)</td>
<td>(11.737)</td>
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<tr>
<td>Parent firm size</td>
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<td>0.249**</td>
<td>0.515**</td>
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<td></td>
<td>(17.244)</td>
<td>(4.005)</td>
<td>(5.394)</td>
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<tr>
<td>Parent firm Local Experience</td>
<td>-2.302***</td>
<td>-2.165**</td>
<td>-2.241***</td>
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<td></td>
<td>(30.601)</td>
<td>(17.189)</td>
<td>(10.851)</td>
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<tr>
<td>Control Variable</td>
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<td></td>
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<tr>
<td>Industry Growth</td>
<td>-0.366**</td>
<td>-0.503***</td>
<td>-0.322</td>
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<td></td>
<td>(10.491)</td>
<td>(7.546)</td>
<td>(1.831)</td>
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<td>Chi square</td>
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<td>73.283***</td>
<td>76.554***</td>
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<td>Number of events</td>
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<td>43</td>
<td>23</td>
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</tbody>
</table>

Notes: a Reference category is WOS.
Wald Statistics in parenthesis;
*significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

5. Conclusion

This study proposed to answer a research question concern the longevity of JV in comparison to other entry modes. While previous research showed high exit rate for JV, the findings of this study revealed the importance of taking into account some measures in order to obtain a better understanding for this question. More specifically, when investigating the impact
of entry modes on survival of overseas subsidiaries, there is a need to distinguish types of firm exit (i.e. liquidation and divestment), types of JV equity ownership (i.e. Majority-, Co-, Minority-owned), while recognizing the existence of different types of JV. That is, JV formed between host- and home-country partners and JV formed only among home-country partners (i.e. Japanese-Japanese JV). By considering these points, the findings did not only answer “yes” or “no”, but present a more clear answer for the research question.

The results found that compared to WOS, the higher exit rate for TIJV is due to capital divestment, not to firm liquidation. However, it can not be generalized for all types of JV. In case of TIJV, the results suggested that only Minority-owned TIJV seems to have a higher probability to be divested than WOS, while Majority-owned TIJV and Co-owned TIJV provided similar rate of capital divestment as WOS. These findings clearly showed a need to control not only for different types of firm exit, but also the importance of controlling equity ownership of TIJV when analyzing firm survival. Studies that have not taken into account these characteristics should lead to misinterpretation of the results.

In addition, the results showed that TIJV (Minority-owned TIJV) is more likely to be exited by divestment than JJ-JV (Affiliated JJ-JV and Unaffiliated JJ-JV). With few exceptions (Makino and Beamish, 1998; Dhanaraj and Beamish, 2004; Ogasavara and Hoshino, 2007), previous studies have not considered the existence of different types of JV. This suggests that establishing JV among partners from the same home-country and consequently with the same culture background, the probability rate to be terminated (through capital divestment) is lower than JV formed between foreign and local partners. Therefore, this cannot to be ignored in investigations of survival firms which considered JV as a part of the analysis.

In interpreting the results in this paper, some limitations have to be considered. First, business culture in Japanese firms is unique and has a long term orientation (Dhanaraj and Beamish, 2004). Future empirical studies should investigate whether the findings of this paper can be generalized to non-Japanese parents based in Brazil or operating in other countries. Second, this study could not include entry mode by acquisition, because only a few number of acquisition was identified in the sample (10 cases in 224). Third, this study only focused on manufacturing firms. Future research should also compare manufacturing and non-manufacturing firms in order to test whether the results could be generalized.

Nevertheless, this study provided a more clear answer concern the survival rate of JV and the first evidence that entry mode, firm characteristics (firm size, diversification, experience in the local market), and industry growth are critical factors for survival of Japanese subsidiaries in Brazil.

6. References


