Determinants for the Equity-Based Entry Mode Choice in the Forest Industry: the Case of China

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Introduction

- Global forest industry has undergone a profound change through industry relocation over the last two decades
- The growing share of foreign direct investment (FDI) flows into developing economics
- China has been regarded as a forest-industry hot-spot in terms of FDI absorptions: the amount of FDI inflows in China has soared from USD 130 million in 2002 to USD 550 million in 2010 (China forestry development report, 2003; 2011)

Figure: Estimated world inward FDI flows in wood and wood products industry
Aim of the study

- Previous literature has considered GDP growth rate and stable institutional environment as main market related features to attract foreign investment in forest sector, while availability of resources has been also found to be important (e.g. Laaksonen-Craig 2004).
- Research on international business in China has been mainly focused on analyzing the forest products trade (e.g. Gan, 2004; Katsigris, et al., 2004; Li and Zhang, 2008), and how relevant policies impact import and export flows between countries.
- However, there is a significant research gap in the analysis of foreign investment in the forest industry in developing/emerging countries.
- This study focuses on identification of the most important determinants of entry mode choice between Joint Venture (JV) and Wholly Owned Subsidiary (WOS) in case of foreign investment by the multinational companies (MNCs) in the context of China.
Theoretical background

- Foreign market entry mode is defined as an institutional arrangement for organizing and conducting firm’s products, technologies, human skills, management and other resources into a foreign market (Root 1987)
- The choice of entry modes is regarded as a trade-off between corporate control and resource commitment
- Several complementary theories (e.g. transaction cost theory, Nordic school, organizational learning theory) have analyzed entry behavior of MNCs from various different perspectives – with mixed results

Diagram:
- Entry mode choice
  - Non-equity based
    - Exporting
    - Licensing
  - Equity based
    - Joint venture
    - Wholly owned subsidiary
The so-called “Nordic school” used the Uppsala and internationalization process (IP) models (Johanson and Vahlne, 1977; 1990; Johanson and Weidersheim-Paul, 1975), which suggests:

- the corporate foreign expansion follows an incremental pattern, through which firm expands gradually from the arm’s length transaction in the psychically close market towards the highly committed investment in the psychically more distant markets

Transaction cost theory: MNCs implement higher control entry mode in large culturally distant markets to minimize economic transaction cost (e.g. Hennart and Reddy, 1997)

In contrast, although MNCs can mitigate costs through high committed entry mode in the cultural distance market, associated higher risks (e.g. political, financial) may hamper MNC’s ambitions

- **H1a**: Increase in cultural distance positively impacts on a firm preference of WOS over JV as entry mode for forest industry MNCs
- **H1b**: Increase in cultural distance negatively impacts on a firm preference of WOS over JV as entry mode for forest industry MNCs
• Geographic distance is generally associated with psychic distance

• Limited empirical research has explored the impact of geographic distance as an isolating factor on the choice of foreign entry mode

• Transaction cost theory: a higher geographic distance leads to higher transportation (logistics) and communication (information asymmetry) costs. MNCs are likely to prefer the geographically closer host countries to minimize firm’s management costs

• Empirical research have controversial outcomes of the effects of geographic distance on entry mode choice. (e.g. Larimo, 1993; Ragozzino, 2009)

• **H2a**: Geographic distance positively effects on the choice of WOS over JV for forest industry MNCs

• **H2b**: Geographic distance negatively effects on the choice of WOS over JV for forest industry MNCs
Hypothesis (3)

- Organizational learning theory (e.g. Cangelosi and Dill, 1965): the importance of knowledge about a foreign market in compensating the substantial “liabilities of foreignness” during the corporate expansion process
- The accumulation of market knowledge and experiences improves MNCs’ market involvement and organizational capabilities
- **H3**: Scope of host country experience positively effects on the choice of WOS over JV for forest industry MNCs

- Transaction cost theory: investment size (e.g. corporate investment assets) representing the corporate financial resource commitment shows a considerable effect on entry mode choice of MNCs
- For the large-sized subsidiary, switching, and exit costs, may cause the prudence of investors in case of high financial and operational risks
- **H4**: Investment size negatively impacts on the choice of WOS over JV for forest industry MNCs
Hypothesis (4)

- Dunning’s eclectic theory: the importance of local level advantages (via market, resources, government legislation etc.) as determinants of MNCs’ entry mode choice. (Dunning, 1977; 1985)

- In the forest industry, resources-seeking is an important motivation of foreign investment. The availability of forest resources and raw materials drives the shift of industry to the forest rich countries. (e.g. Laaksonen-Craig, 2004)

- **H5**: Availability of resources negatively impacts on the choice of WOS over JV for forest industry MNCs

- Porter (1990) describes that the spatial concentration of an industry (a cluster) could effectively help to manage upstream and downstream economic activities

- High-tech MNCs have been argued embedding deeper into local industry cluster than capital intensive manufacturing industry. (Birkinshaw and Hood, 2000)

- **H6**: Spatial concentration positively impacts on the choice of WOS over JV for forest industry MNCs
Summary of conceptual framework

Diagram showing the relationships between cultural distance, geographical distance, Forest MNCs, Host Country Experience, Investment Size, and Entry Mode Choice, as influenced by Resources, Host Country, and Spatial Concentration of Industry.
Data (1)

- **Target population:** large MNCs who are listed as the Top 100 Global Forest, Paper & Packaging Industry Companies (PwC, 2012)

- **Observations:** subsidiary level investment projects (with entry mode either WOS or JV), which have already been established in mainland China

- **Subsidiary level information** is mainly collected from MNC’s annual financial reports, subsidiary's home pages, and other relevant brochures

- **Macro level information** is collected through government authorities (i.e. China Statistical Yearbook, 2011; 2012; China Forestry Statistical Yearbook, 2011)

- **Few investment projects with incomplete information** had to be dropped out from final sample, which consisted of **109 subsidiary investment projects**
The dependent variable is entry mode choice (WOSs vs JVs) which is captured by a dummy variable (WOS=1, JV=0)

Out of 109 observations, 86 subsidiaries are WOSs and 23 subsidiaries are JVs

<table>
<thead>
<tr>
<th>Theoretical determinant</th>
<th>Empirical proxy</th>
<th>Definition</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural distance</td>
<td>Cultural distance index (CDI)</td>
<td>Calculation of CDI based on Hofstede’s cultural dimensions</td>
<td>--</td>
</tr>
<tr>
<td>Geographic distance</td>
<td>Geographic distance</td>
<td>Straight line distance between MNC’s headquarter and the location of subsidiary</td>
<td>km</td>
</tr>
<tr>
<td>Host Country Experience</td>
<td>Years of presence in China</td>
<td>Years of presence that MNC has had in China before the subsidiary is established</td>
<td>--</td>
</tr>
<tr>
<td>Investment size</td>
<td>Assets</td>
<td>Registered value capital of subsidiary (in 2011 value)</td>
<td>RMB</td>
</tr>
<tr>
<td>Resources</td>
<td>Wood production</td>
<td>Wood production at province level in China</td>
<td>M³</td>
</tr>
<tr>
<td>Spatial concentration of forest industry</td>
<td>Forest sector GDP/ Land area of province</td>
<td>Forest sector GDP/ Land area of province</td>
<td>USD/km²</td>
</tr>
</tbody>
</table>
Methodology

- Logistic regression has been chosen as the method for data analysis
- Logistic distribution \( F(x_i | \beta) = \frac{e^{x_i \beta}}{1 + e^{x_i \beta}} \) could guarantee the assumption of probability values only within the [0; 1] interval
- The probability of a MNC choosing WOS over JV as a preference \( (P(y_i=1|x_i)=F(x_i \beta)) \) could be modeled by the natural logarithm (ln) of odds of choice as:

\[
\text{logit } (p) = \ln \frac{p}{1 - p}
\]

where \( p \) is the probability of WOS being chosen as entry mode, while \( 1-p \) is the probability of JV being chosen as entry mode

- Along with the transformation, the linear function of the model is as follows:

\[
\text{logit}(p) = X\beta + \mu,
\]

where \( X \) is the matrix of independent variables, \( \beta \) is the vector of estimated coefficients, and \( \mu \) is the vector of error term
Results (1)
Results (2)
Results (3)

Since independent variables are measured at different scales, Z-scores transformation has been used to standardize variable values.

Table 2. Means, standard deviations, correlations and multi-collinearity among independent variables.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Descriptive statistics</th>
<th>Pearson correlations</th>
<th>Multi collinearity</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CDI</td>
<td>1.99</td>
<td>1.36</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Geographical distance</td>
<td>5467</td>
<td>4465</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of presence</td>
<td>7.14</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assets (Million)</td>
<td>2310</td>
<td>6922</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood productions</td>
<td>2734531</td>
<td>3156245</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest GDP density</td>
<td>301987</td>
<td>236376</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01 (two-tailed)
### Results (4)

**Table 3. Logistic regression results**

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>B coefficient</td>
<td>(Odds Ratio)</td>
<td>Sig.</td>
<td>B coefficient</td>
<td>(Odds Ratio)</td>
<td>Sig.</td>
</tr>
<tr>
<td>Z-CDI</td>
<td>-1.086 (0.338)</td>
<td>**</td>
<td>*</td>
<td>-1.511 (0.221)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Z-Geographical distance</td>
<td>0.736 (2.087)</td>
<td>**</td>
<td>*</td>
<td>1.021 (2.775)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Z- Years of presence</td>
<td>0.597 (1.817)</td>
<td>**</td>
<td></td>
<td>0.529 (1.697)</td>
<td>*</td>
<td></td>
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<tr>
<td>Z-Assets</td>
<td>0.183 (1.201)</td>
<td></td>
<td></td>
<td>0.216 (1.241)</td>
<td></td>
<td></td>
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<tr>
<td>Z-Wood productions</td>
<td>0.055 (1.056)</td>
<td></td>
<td></td>
<td>0.879 (2.407)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Z-Forest GDP density</td>
<td>1.738 (5.688)</td>
<td>**</td>
<td>*</td>
<td>1.902 (6.702)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pseudo R²</td>
<td>0.294</td>
<td></td>
<td></td>
<td>0.385</td>
<td></td>
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<tr>
<td>H &amp; L Test</td>
<td>0.558</td>
<td></td>
<td></td>
<td>0.565</td>
<td></td>
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<tr>
<td>Specificity</td>
<td></td>
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<tr>
<td>Sensitivity</td>
<td></td>
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<tr>
<td>Overall % correct</td>
<td>78.9</td>
<td></td>
<td></td>
<td>82.6</td>
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<tr>
<td>Log odds</td>
<td>2.872</td>
<td></td>
<td></td>
<td>3.901</td>
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</tr>
</tbody>
</table>

* p<0.10; ** p<0.05; *** p<0.01 (two-tailed)
Re-check of the conceptual framework
Discussion and conclusion (1)

- The contribution of this study is the improved knowledge on corporate level of how host country characteristics impact on MNCs’ equity-based entry mode choice in the forest industry investment in China.
- The results are partly consistent with international business literature, but provide further insight in the forest sector.
- For a forest industry MNC with less familiarity with Chinese market and culture, cooperating with a local partner to start business has been a viable choice.
- Importance of local knowledge for MNCs in order to have a highest control of their subsidiary.
- MNCs choose WOS in regions with higher spatial concentration of forest industry to lower transaction costs and improve operational efficiency.
- MNCs rely on importing raw materials rather than the arm length’s suppliers in the local market. (caused by strict forest protection policy, comparatively high price of plantation pulpwood.)
Discussion and conclusion (2)

- Forest industry MNCs’ investment in China is based on market-seeking rather than resource-seeking strategies.

- MNCs’ strategic management should clearly focus on reaping market and supply-chain benefits from their Chinese subsidiaries rather than pursuing cost efficiency strategies based on local resources.

- Limitation of this study is naturally the available limited sample size.

- Results are tentative rather than fully conclusive:
  - Our result might be biased towards the global MNC level in a single country context, and in other host countries these effects may differ.
  - Cross sectional analysis of subsidiaries ignored the timing as an important impact on MNC decisions, as well possible failed investments that have disappeared before 2013.

- Future studies should focus on more specific impacts (e.g. MNCs’ financial perspective, R&D level), and comparison between MNCs and smaller-sized corporations (including born global firms) would be a worthy task.
Thanks for your attention!