Diversified Business Models of Non-integrated Steel Company in Developing Countries: The Cases of Cold Rolling Company in Thailand and Vietnam

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Nozomu Kawabata (川端望)
Graduate School of Economics and Management, Tohoku University, Japan
1 Cold Rolling as an Entry Point to Steel Industries in Thailand and Vietnam under the International Economic Integration
Integrated Production System of Iron and Steel

- There is no large scale integrated iron and steel company in Vietnam
- Some projects are in progress
  - Most of them are invested by foreign companies

Source: Kawabata [1995]
There is no large-scale blast furnace and basic oxygen furnace in Thailand and Vietnam

A picture is omitted in the version disclosed on website.

Steel Industry Promotion under the Economic Integration (Kawabata[2005])

- **Old type policy**
  - Import substitution industrialization
  - Integrated iron and steelworks as a major target for national industrialization
  - Strong protection for local company, including state ownership.

- **New Type Policy**
  - Export oriented industrialization
  - Mechanical, electrical and electronic equipment industries as a major targets for national industrialization
  - Liberalization of trade and investment
  - Foreign-affiliated and private companies as major players

Defeat in 1980s
Steel Industry Promotion under the Export-oriented Industrialization Policy

• Backward linkage effect
  – Steel market expansion → Steel industry development
  – Building from downstream processes is rational

• Stratification of steel market
  – Export industry with foreign-affiliated companies needs equal level of quality and service to steel suppliers
  – High grade steel market emerges in the early stage of industrialization
  – Wide gap of price, quality, cost between high and low segment
Production Process of Sheet Rolling Companies in Thailand (Kawabata[2003])

- **G-Steel, G-J Steel**

  Steel scrap → Electric Arc Furnace → Thin-Slab Casting → Compact Hot Strip Mill → Hot Rolled Sheets and Strip

- **Sahaviriya Steel Industries**

  Slab → Full Scale Hot Strip Mill → Hot Rolled Sheets and Strip

- **Thai Cold Rolled Sheet (TCRSS), The Siam United Steel (SUS), BlueScope Steel (Thailand)**

  Hot Rolled Strip → Cold Rolling Mill → Cold Rolled Sheets and Strip
Production Process of Sheet Rolling Companies in Vietnam (Kawabata[2007])

- Phu My Flat Steel (PFS), Ton Nhat Flat Steel (Started in 2009), POSCO Vietnam (Started in 2009)

- Sun Steel (SUNSCO), Hoa Sen Group (HSG)
Apparent Consumption of Steel in Thailand and Vietnam is Rapidly Increasing

Note: Apparent consumption = Production - Export + Import. To avoid double counting, production is represented by hot-rolled steel, while export and import is represented by finished steel. Source: Compiled from SEAISI[various years].
Composition of Consumption of Flat Steel Products in Thailand and Vietnam in 2008

Consumption of Flat Steel Products in Thailand in 2008

- Surface treated sheets and strip 32%
- Cold rolled sheets and strip 18%
- Hot rolled plates, sheets and strip 50%

Total: 8.28 million tons

Consumption of Flat Steel Products in Vietnam in 2008

- Surface treated sheets and strip 27%
- Cold rolled sheets and strip 12%
- Hot rolled plates, sheets and strip 61%

Total: 4.40 million tons

Source: Compiled from SEAISI[2009].
Import Substitution of Cold Rolled Sheets and Strip has Completed in Thailand

Consumption, Production, Export and Import of Cold Rolled Sheets and Strip in Thailand

Source: Compiled from SEAISI[2009]
Vietnam is on the Way to Import Substitution of Cold Rolled Sheets and Strip

Consumption, Production, Export and Import of Cold Rolled Sheets and Strip in Vietnam

Source: Compiled from SEAISI[2009]
2 Case Studies of Four Cold Rolling Companies in Thailand and Vietnam
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Thailand</td>
<td>Thailand</td>
<td>Vietnam</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Initial Major Shareholders</td>
<td>Sahaviriya Steel Industries (SSI) and other Thai shareholders: 70.0%, NKK: 11.5%, Marubeni: 11.5%, Nichimen and other Japanese investors: 7.0%</td>
<td>Siam Cement and other Thai shareholders 60.0%, Nippon Steel and other Japanese shareholders: 37%, POSCO: 3%</td>
<td>Tafong and other Taiwanese investors: 100%</td>
<td>Le Phuoc Vu: 90.64%</td>
</tr>
<tr>
<td>Current Major Shareholders</td>
<td>SSI and other Thai shareholders 51%, JFE Steel and other Japanese shareholders: 49%</td>
<td>Nippon Steel and other Japanese shareholders: 76.1%, Thai shareholders: 11.7%, POSCO: 12.3%</td>
<td>Maruichi Steel Tube and other Japanese shareholders: 82.0%, Taiwanese shareholders: 18.0%</td>
<td>Le Phuoc Vu: 47.10%, Other Vietnamese shareholders: 48.37%, Foreign individuals and institutions: 4.59%</td>
</tr>
<tr>
<td>Nationality of Company</td>
<td>Subsidiary of Thai and Japanese Companies</td>
<td>Subsidiary of Japanese Company</td>
<td>Subsidiary of Japanese company</td>
<td>Vietnamese Local Company</td>
</tr>
<tr>
<td>Capacity of Cold Rolling Mill (1000t/y)</td>
<td>1,000</td>
<td>1,000</td>
<td>250</td>
<td>180</td>
</tr>
</tbody>
</table>

Source: Company websites, interviews, plat visits, annual reports, and newspapers.
TCRSS and SUS have Tandem Type Cold Rolling Mills

Cold Rolling Mill at TCRSS

- High level equipment with knowledge and know-how for high grade products gives TCRSS and SUS technological superiority

Source: Pamphlet of TCRSS.
Hierarchical Inter-Firm Division of Labor in Sheet Sector of Thailand

Note: g2 and g3 means all of TCRSS, SUS and BlueScope make cold rolling.

This figure shows the situation around 2007. It might have changed.
Source: Interviews and plant visits in March 2003, August 2006 and August 2007, disclosed data of the companies.
Source: Kawabata [2008].
TCRSS and SUS: Cross-Border Process Linkages for High Grade Steel Production

• **High grade segment**: TCRSS, SUS and other foreign-affiliated suppliers
  – Electrolytic Galvanized Sheet for electric and electronic home appliance
  – Cold rolled sheet for body of automobile
  – Tinplate and tin-free plate for food can, cold rolled sheet for motorbike

• **Middle and Low grade**: Foreign-affiliated and local suppliers
Managerial and Financial Problems at TCRSS and SUS

• Capital increase forced by Asian financial crisis
• Conflict between SSI and TCRSS/SUS
  – Anti-dumping suit by SSI → Stop of technical assistance and slab supply from JFE Steel
  – Repurchasing of share of TCRSS by SSI
• Difficulty of extending supply chain for TCRSS and SUS
  – Building a continuous galvanizing line for automobile industry is a good option for each interest of TCRSS and SUS
  – Parent companies (SSI, JFE Steel, Nippon Steel) have other strategic options for Thai steel market---Construction of integrated steelworks with other subsidiaries
• Thin profit business in spite of high level of technology
  – Accumulated loss has not been depreciated yet in 2009
Reversing Cold Rolling Mills at SUNSCO (left) and HSG (right)

- Initial cost is lower than tandem mill
- Productivity is lower than tandem mill

A picture is omitted in the version disclosed on website.

Source: Author took those pictures with permission on August 21, 2009 (SUNSCO) and August 30, 2007 (HSG).
Material Flows and Hierarchical Inter-firm Division of Labor in Sheet Sector of Vietnamese Steel Industry around 2008

- **Imported hot rolled coil for conventional use**
  - **Cold rolling mill (PFS, SUNSCO, Hoa Sen Group)**
  - **Imported galvanized sheet and pre-painted coated sheet for conventional use**

- **Imported cold rolled coil for conventional use**
  - **Surface Treating Lines (BlueScope, SSSC, SUNSCO, Hoa Sen Group, Posvina, etc)**
  - **Middle and low grade markets**
    - (Conventional application for construction and manufacturing for domestic consumption)

- **Imported high grade cold rolled coil (Deep drawing sheet, electrical sheet, tin mill black plate, etc)**
  - **Tinplating Lines (Perstima Vietnam)**
  - **Imported high grade surface treated sheets (Galvannealed sheet, Electrolytic galvanized sheet, etc)**
  - **High grade markets**
    - (High grade application for Automobile, Electrical and electronic equipment, motorbike, home appliance for export)
  - **Imported tinplates**

Note: POSCO Vietnam was not operated in 2008. The situation might have changed. Source: Author compiled based on factory visits, interviews and various materials. Source: Kawabata [20007] with minor revision.
Hierarchical Division of Labor in Vietnam was not Clear Than That of Thailand (Kawabata [2007])

- The market of high-grade sheets is smaller than Thailand.
- Most high-grade sheets are imported.
  - There is only one producer: Perstima Vietnam (Tinplate and Tin-free Plate). Its technology source is JFE Steel in Japan
  - POSCO-Vietnam started its operation in 2009. It is possible to produce high-grade sheets.
- Most producers in Viet Nam are producing low and middle grade sheets.
  - SUNSCO, HSG, PFS: Cold rolled sheet for construction
- It reflects the limited achievement of the industrialization in Vietnam.
SUNSCO: From Taiwanese Promoter to Japanese Manufacturer

- Instituted in 1996 as Vina Ta Fong by Taiwanese investment group
- Production equipment is steady one
- SUNSCO applied licenses for big projects again and again. *All of them did not start construction*
- SUNSCO went under in 2006 and Maruichi Steel Tube from Japan began rehabilitation as a new owner
  - Restarted operation
  - Entry to construction market with middle grade products like 55% Aluminum-Zinc coated sheet and 16 inches steel pipe
  - Marketing activity is weak. Export ratio is 40% in spite of effort to sell in Vietnam
Hoa Sen Group: Market Development with Distribution Network in Vietnam

- Backward integration and technological upgrading
  - Distribution→Painting→Galvanizing→Cold Rolling
  - Simple second hand galvanizing line→large scale surface treating line
- Marketing with distribution networks have been succeeded
  - Very thin sheet for individual house
  - Wide selection of construction materials, secondary processing service
  - HSG has 82 distribution centers of its own. 92% of products is sold to domestic market

Source: Website of HSG (Browsed on October 6, 2010).
3 Concluding Remarks
## Business Model of Four Cold Rolling Companies

<table>
<thead>
<tr>
<th>Company Name</th>
<th>TCRSS</th>
<th>SUS</th>
<th>SUNSCO</th>
<th>HSG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source of Competitive Advantage</strong></td>
<td>Technological capability with cross-border process linkage</td>
<td>Technological capability with cross-border process linkage</td>
<td>Technological capability</td>
<td>Marketing capability based on local condition of Vietnam</td>
</tr>
<tr>
<td><strong>Entry Barrier</strong></td>
<td>High level equipment, knowledge and know-how for high grade products</td>
<td>High level equipment, knowledge and know-how for high grade products</td>
<td>No high entry barrier. Product differentiation is needed</td>
<td>Distribution network is weak in Vietnam. Direct control of HSG works well</td>
</tr>
<tr>
<td><strong>Business Model</strong></td>
<td>Stable supply to the customers in high-grade segment by process linkage</td>
<td>Stable supply to the customers in high-grade segment by process linkage</td>
<td>(Taiwanese Shareholder) Promoter: Envisaging projects and collecting investors</td>
<td>Grasping Vietnamese customers with low cost production, relatively high value-added products and distribution network</td>
</tr>
<tr>
<td><strong>Profit-making</strong></td>
<td>Thin profit</td>
<td>Thin profit</td>
<td>Rehabilitation has just been completed</td>
<td>High profit</td>
</tr>
<tr>
<td><strong>Problem</strong></td>
<td>Dependence on parent company’s strategy and operation</td>
<td>Dependence on parent company’s strategy and operation</td>
<td>Dependence on parent company’s strategy</td>
<td>Need to change business model for expanding market segment to higher one</td>
</tr>
</tbody>
</table>

Source: Author edited.
Implication of Diversity of Business Model

- Export-oriented industrialization leads to stratification of steel sheet markets of developing economies
- Foreign-affiliated companies can get high grade segment because of technological superiority and stable relationship with parent companies and customers
- Local companies have a chance to developing domestic market with marketing capability based on local people’s life
- Development path of steel industry in developing economies is not monolithic
Reference

• English Language
  – South East Asia Iron and Steel Institute (SEAISI) [various year] Steel Statistical Yearbook, SEAISI.

• Vietnamese Language

• Japanese Language
  – Nippon Steel Kimitsu Works [2000], Nippon Steel Kimitsu Now.