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

Presented at International Conference "Economic Policy for Further Development of Asia-Pacific Region", Foreign Trade University, Hanoi, October 11, 2010

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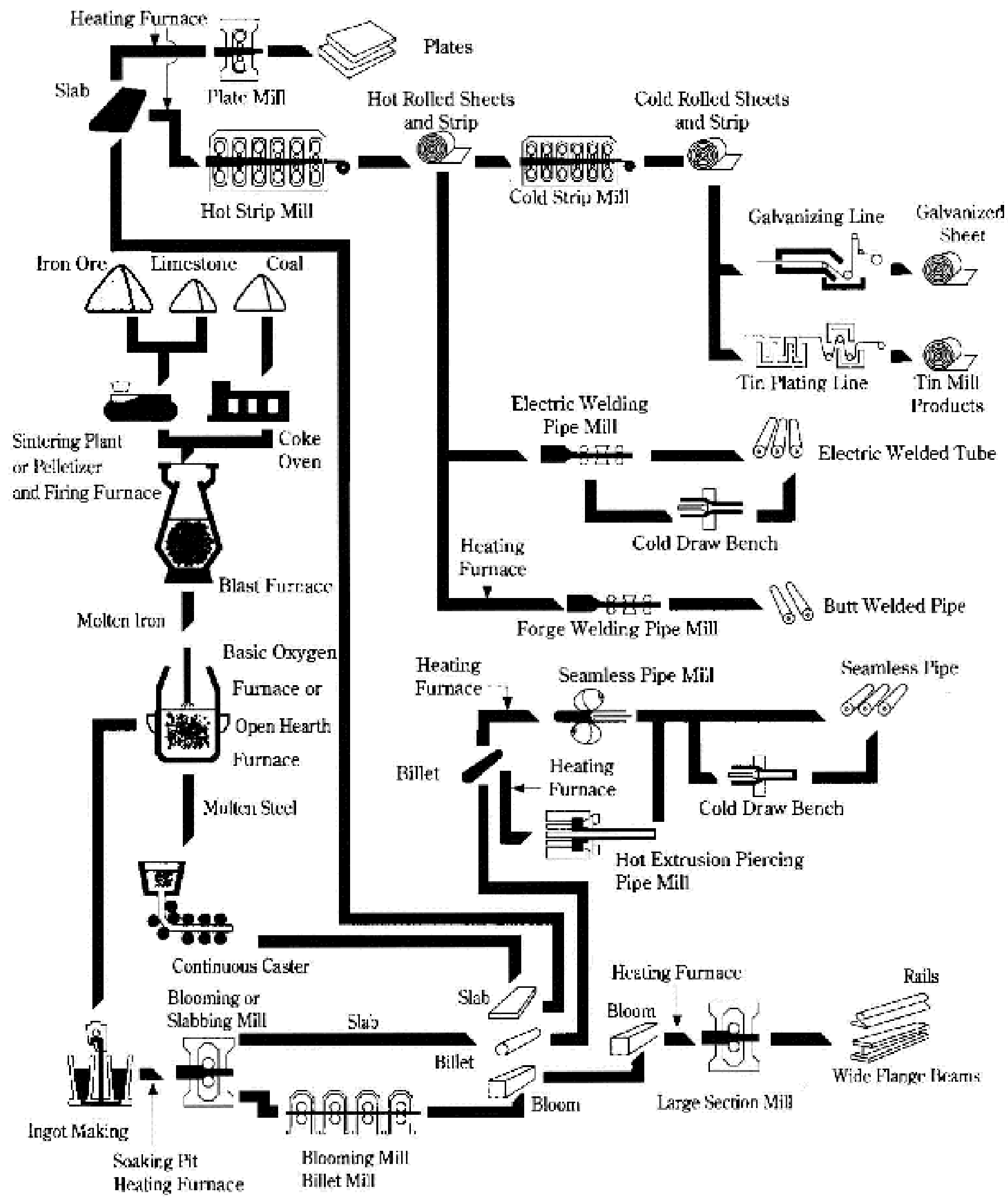
1 Cold Rolling as an Entry Point to Steel Industries in Thailand and Vietnam under the International Economic Integration

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.

Source of pictures: Nippon Steel Corp. Kimitsu Works[2000].

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.

Defeat in 1980s

- 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

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

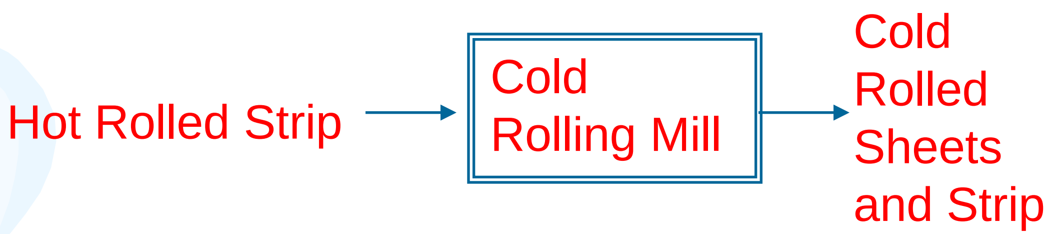
Slab → Full Scale Hot Strip Mill → Hot Rolled Sheets and Strip

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

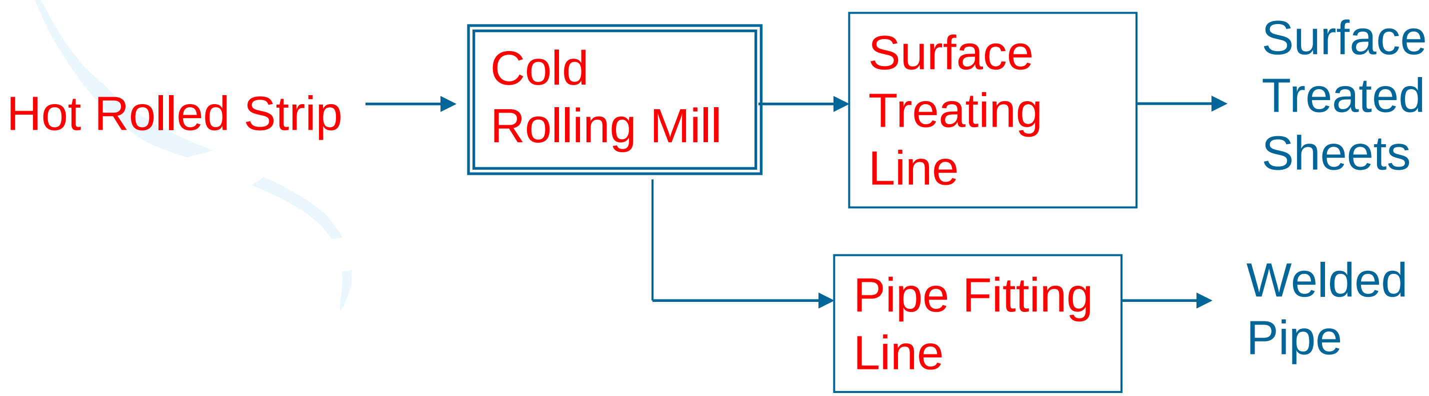
Hot Rolled Strip → Cold Rolling Mill → Cold Rolled Sheets and Strip

Production Process of Sheet Rolling Companies in Vietnam (Kawabata[2007])

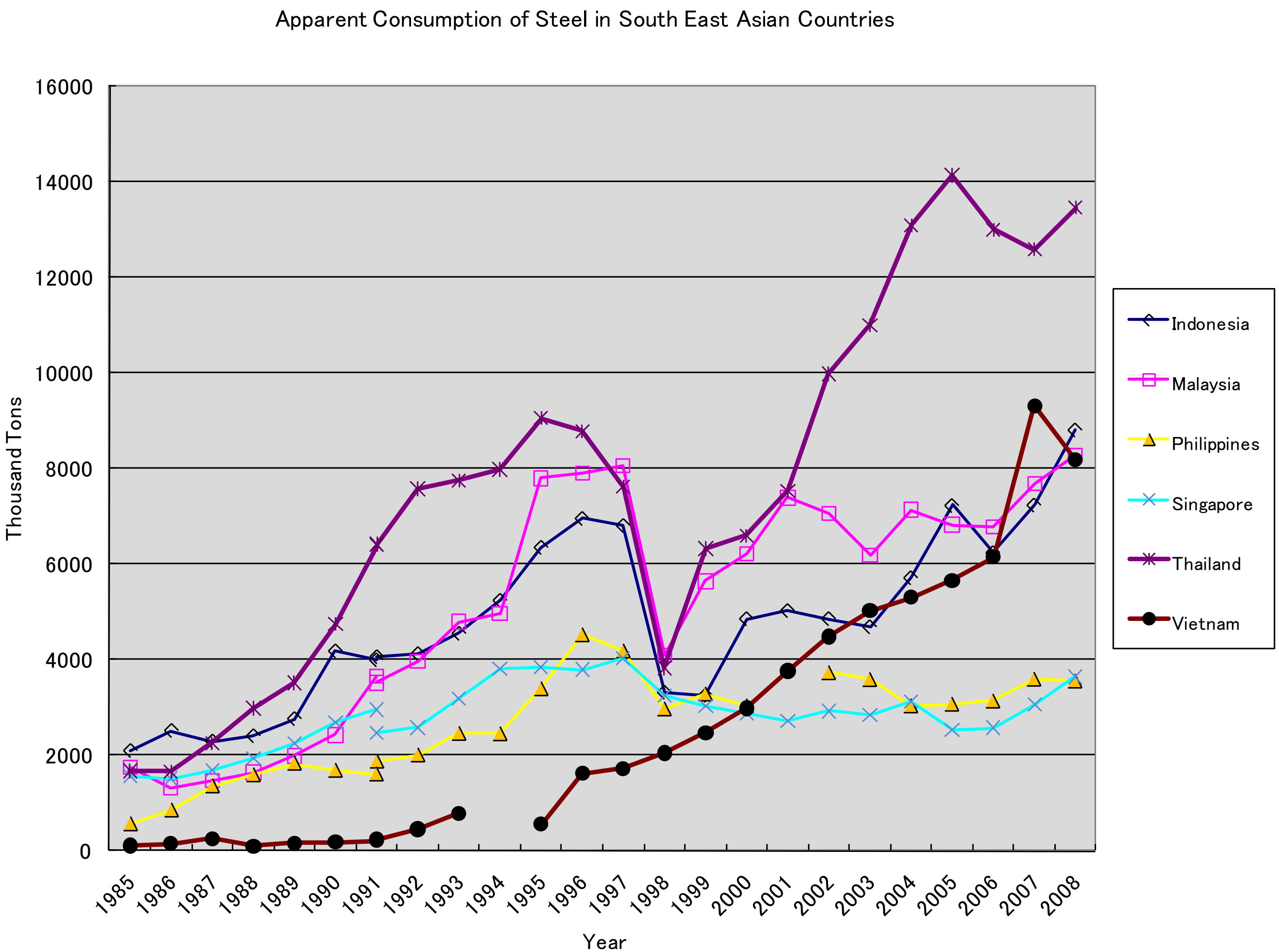
- Phu My Flat Steel (PFS) , Ton Nhat Flat Steel(Started in 2009), POSCO Vietnam (Started in 2009)



- Sun Steel (SUNSCO), Hoa Sen Group (HSG)

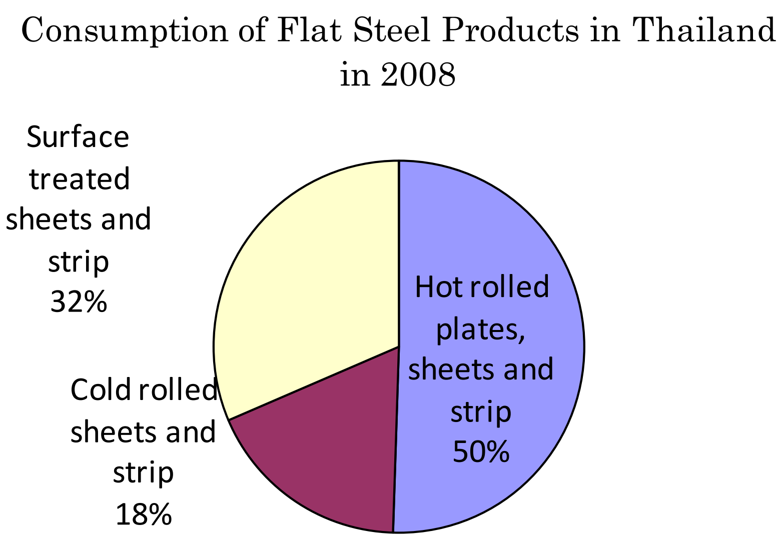


Apparent Consumption of Steel in Thailand and Vietnam is Rapidly Increasing

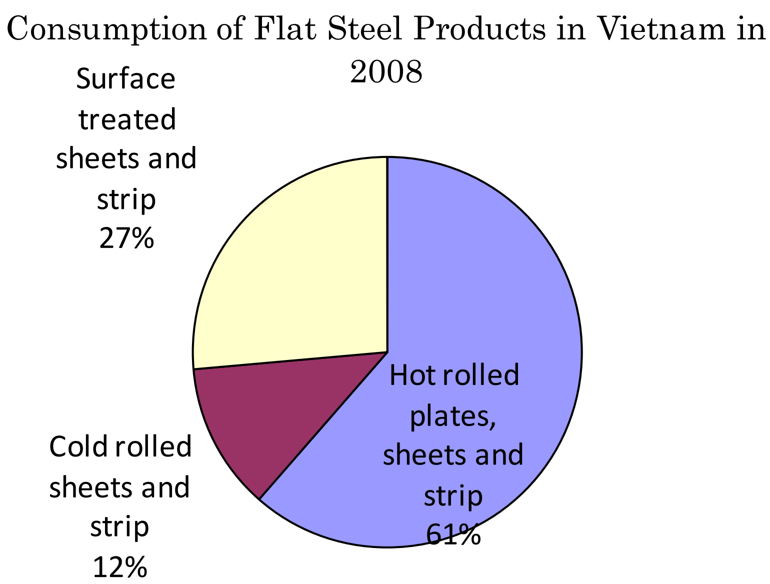


Note: Apparent consumption = Production - Export + Import. To avoid double counting, production is represented by hot-rolled steel, while export and import is represented by finished steel. Source: Compiled from SEAISI[various years].

Composition of Consumption of Flat Steel Products in Thailand and Vietnam in 2008



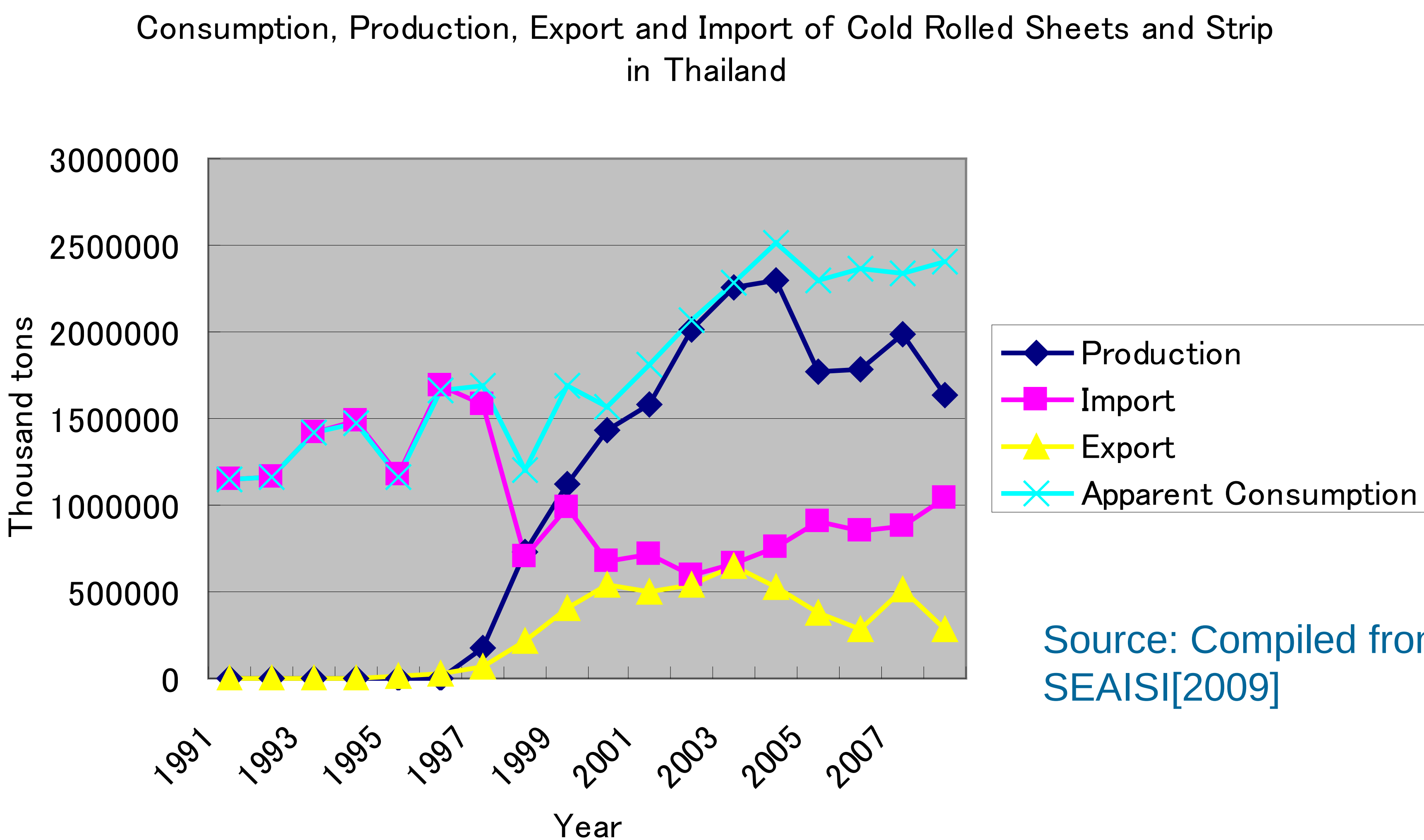
Total: 8.28 million tons



Total: 4.40 million tons

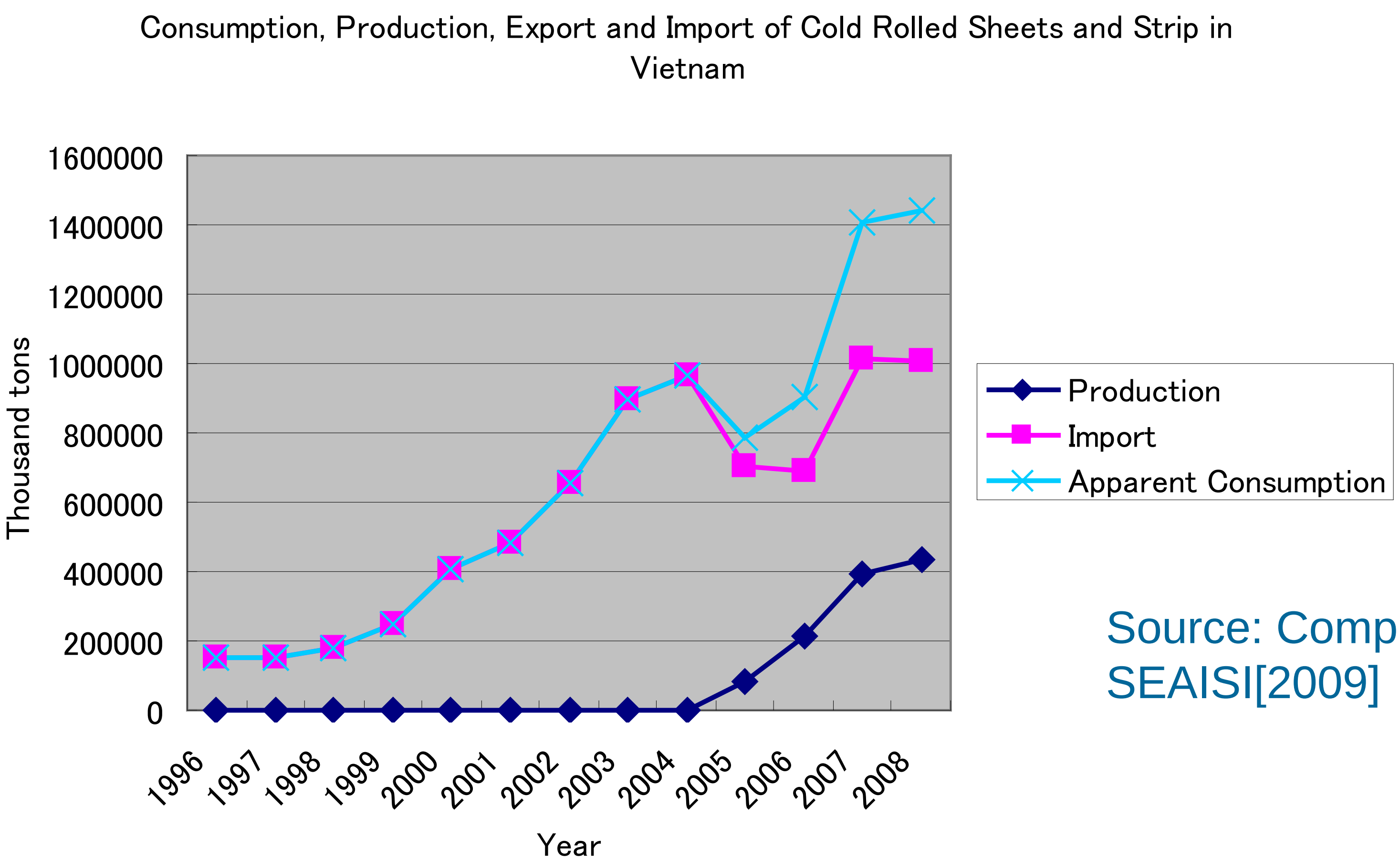
Source: Compiled from SEAISI[2009].

Import Substitution of Cold Rolled Sheets and Strip has Completed in Thailand



Source: Compiled from SEAISI[2009]

Vietnam is on the Way to Import Substitution of Cold Rolled Sheets and Strip



Source: Compiled from SEAISI[2009]

2 Case Studies of Four Cold Rolling Companies in Thailand and Vietnam

Profile of Cold Rolling Companies for Case Studies

Company Name	Thai Cold Rolled Steel Sheet Public Co., Ltd. (TCRSS)	The Siam United Steel(1995) Co., Ltd.(SUS)	Sun Steel Joint Stock Company (SUNSCO)	Hoa Sen Group (HSG)
Location	Thailand	Thailand	Vietnam	Vietnam
Company start-up	1995 (JV contract)	1995	1996	2001
Initial Major Shareholders	Sahaviriya Steel Industries (SSI) and other Thai shareholders: 70.0%, NKK: 11.5%, Marubeni: 11.5%, Nichimen and other Japanese investors: 7.0%	Siam Cement and other Thai shareholders 60.0%, Nippon Steel and other Japanese shareholders: 37%, POSCO: 3%	Tafong and other Taiwanese investors: 100%	Le Phuoc Vu: 90.64%
Current Major Shareholders	SSI and other Thai shareholders 51%, JFE Steel and other Japanese shareholders: 49%	Nippon Steel and other Japanese shareholders:76.1%, Thai shareholders: 11.7%, POSCO: 12.3%	Maruichi Steel Tube and other Japanese shareholders:82.0%, Taiwanese shareholders: 18.0%	Le Phuoc Vu: 47.10%, Other Vietnamese shareholders: 48.37%, Foreign individuals and institutions: 4.59%
Nationality of Company	Subsidiary of Thai and Japanese Companies	Subsidiary of Japanese Company	Subsidiary of Japanese company	Vietnamese Local Company
Capacity of Cold Rolling Mill (1000t/y)	1,000	1,000	250	180
Products	Cold Rolled Coil (Annealed) Cold Rolled Coil (Full Hard)	Cold Rolled Coil (Annealed) Cold Rolled Coil (Full Hard) Cold Rolled Tin Mill Black Plate	55% Aluminum-zinc coated sheet Pre painted coated sheet Welded pipe, Galvanized pipe Bar Wire rod	Galvanized sheet 55% Aluminum-zinc coated sheet Pre painted coated sheet

Source: Company websites, interviews, plat visits, annual reports, and newspapers.

TCRSS and SUS have Tandem Type Cold Rolling Mills

Cold Rolling Mill at TCRSS

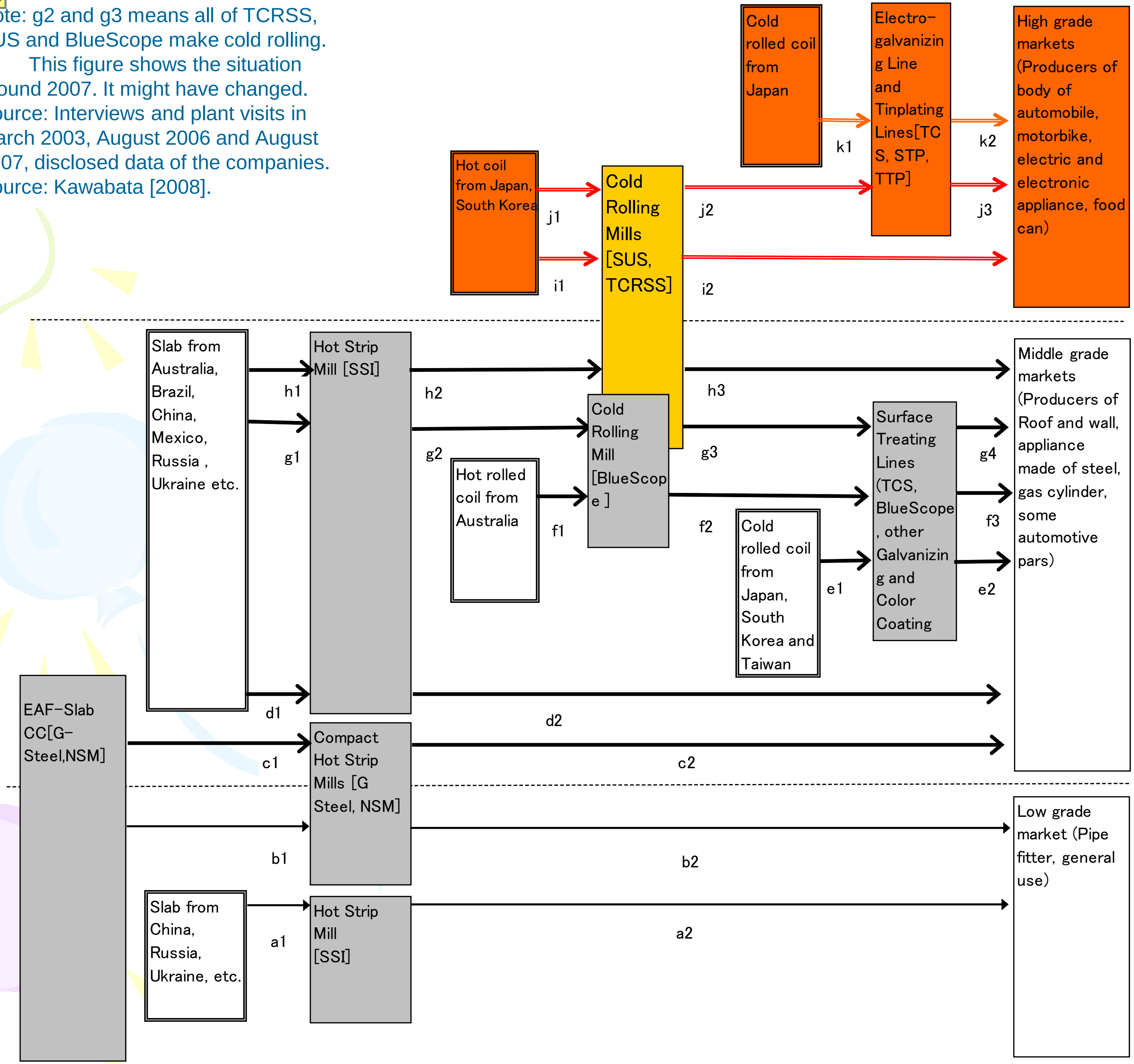
A picture is omitted in the version disclosed on website.

- 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

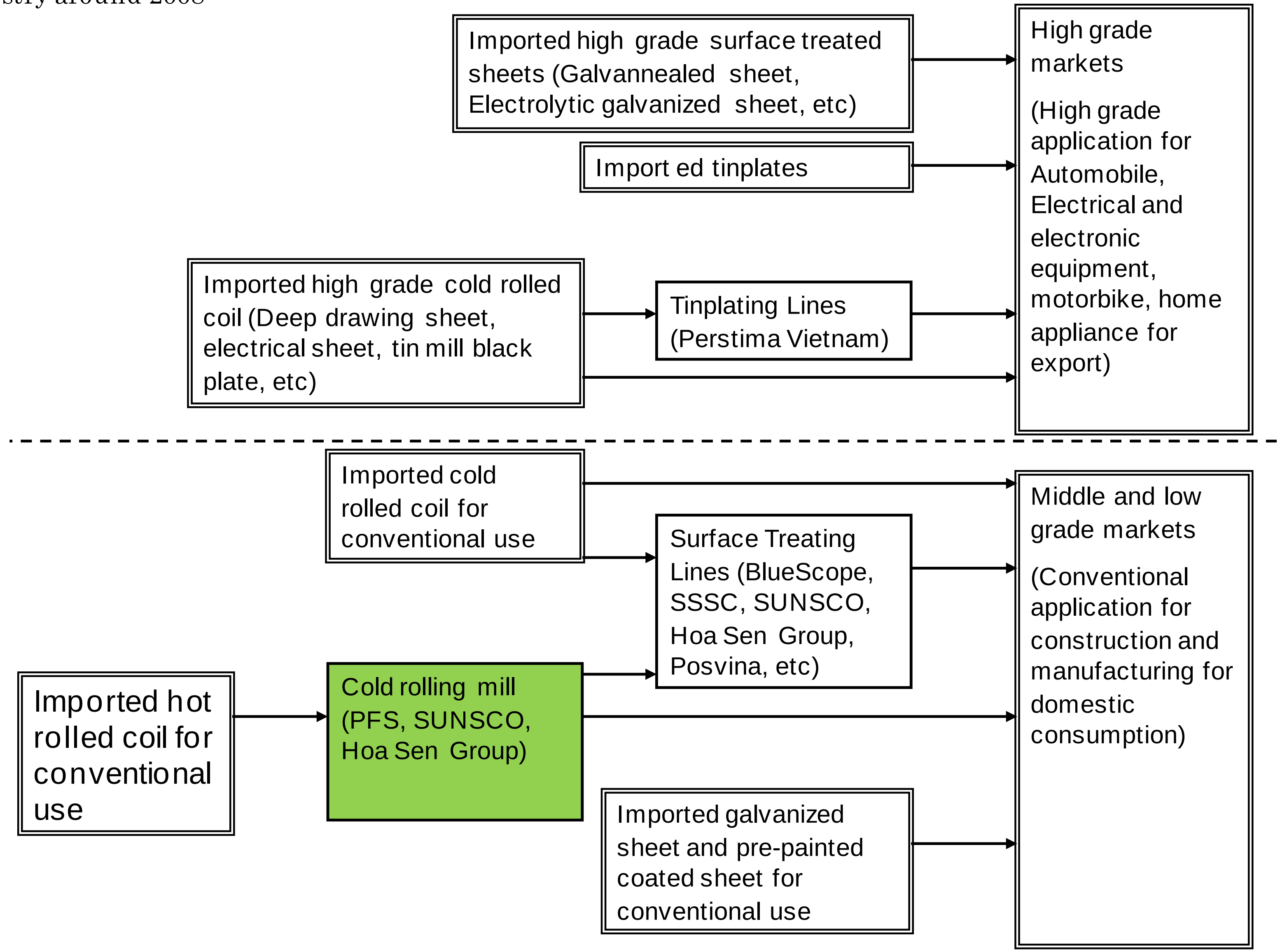
A picture is omitted in the version disclosed on website.

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).

Hierarchical Division of Labor in Vietnam around 2008

Material Flows and Hierarchical Inter-firm Division of Labor in Sheet Sector of Vietnamese Steel Industry around 2008



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

Location of HSG's Distribution Center

A Figure is omitted in the version disclosed on website.

Source: Website of HSG (Browsed on October 6, 2010).

3 Concluding Remarks

Business Model of Four Cold Rolling Companies

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

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 relation ship 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

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