# Globalization of the Steel Industry

**By**

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## Abstract

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Steel is the vital and basic engineering material, underpinning all industrial development. Today consumption of steel is running at around 750 million tonnes a year, and world demand for steel is likely to grow for the foreseeable future. While steel is sold across international markets, it is primarily produced and supplied by national rather than global companies. The globalization of the steel producers is realized by way of the following processes: the progression of steel industry ownership from the state to the private sector, intra-regional alliances and consolidation, joint ventures with foreign partners, and finally full globalization. In this thesis, POSCO will be reviewed as a successful case of globalization. The successful companies in the future are likely to be embracing new technologies, be internationally cost competitive, and financially focused. They are also likely to have a network of strategic partners and joint ventures, with a much greater flexibility than has been exhibited by companies in the past.

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# Part I. Introduction

It is considered that steel production capacity is one measure of an economy. The steel industry is one of the fundamental industries in both developed and developing countries. Those countries that have tried to make economic development schemes concentrated their efforts on fostering their steel industries. Leading countries such as USA and Western European countries have developed their steel industries in that way. Japan has also devoted its efforts on expanding its steel production capacity during the economic development period. Emerging countries such as South Korea and Brazil have set their steel industries No.1 position in economic development plans. Many developing countries already have significant steel production capacities or developing their steel industries based on their plans.

Steel industry has several characteristics. It is a capital-intensive industry that requires huge capital (facility) investment. It requires huge resources and needs various kinds of raw materials and energies as inputs. Also, this industry has a big influence to other industries. Accordingly, the countries which could produce better steel products more cheaply, are more competitive in the industries that use steel products for their raw materials. Besides, steel industry has a characteristic such that it can not control the imbalance between supply and demand easily. In the economic recession, steel producers can not easily reduce their supplies, even though steel demands decrease, so the steel product price can fall sharply. On the contrary, in the economic boom, steel prices rise quickly, because steel producers can not expand their capacity in a short period. There is significant economies of scale in this industry. It means that entry barrier is very high due

to the burden of huge initial investment needed. Besides, in the steel industry, the choice of production base is very important, because the flow of material is an important factor in the securing of competitiveness.

## 1. Scope of the Study

This study focuses mainly on the globalization process of steel companies in North America, Europe and Asia. Part II reviews the globalization of the world steel producers. The structural changes in the steel industry and forces at work will also be examined in this part. In Part III, POSCO's case will be reviewed as a specific case study of globalization. POSCO is the world's largest steel producer, with 1998 crude steel production of 25.57 million tons. POSCO was founded in 1968, and in fewer than 30 years, became the world's largest steel producer. In POSCO's case, performance analysis of globalization and future tasks and directions will be reviewed.

## 2. Methods of the Study

This study depends largely on literature research and case studies. Datas have been collected from various steel industry research reports, several companies' CEO speeches, and POSCO's publicly available information. Additional data and information were also obtained from Internet sites and recently published company reports.

# Part II. Globalization of the Steel Industry

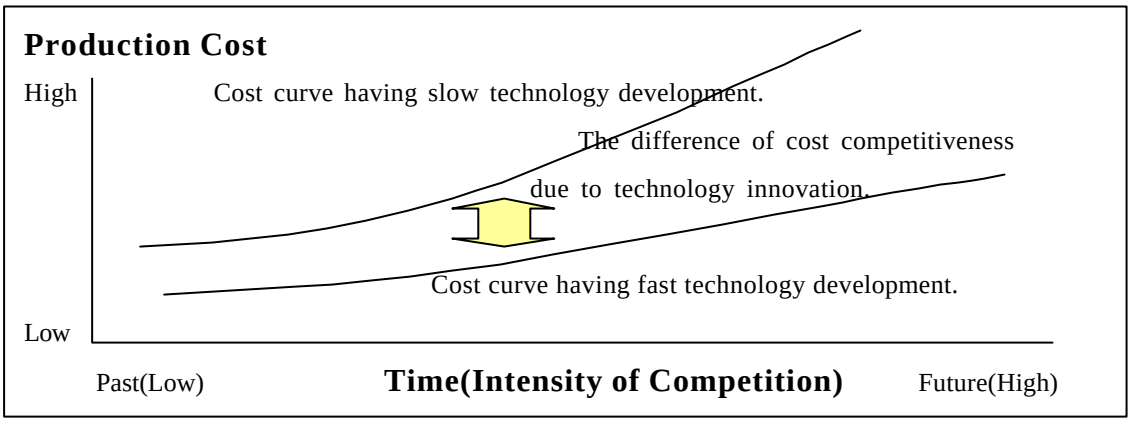
## 1. Structural Changes of the World Steel Industry

### 1). Rapid Development of Innovative Steel Technology

Historically, technology has been an important influence in the steel industry. For example the countries that developed or introduced innovative steel technologies timely have established leadership in the world steel industry. From the 18$^{th}$ century to the end of 19$^{th}$ century, the U.K that invented the technology of *Bessmer converter* and *blast furnace using coals* took the leadership in the world steel industry. From the early 20$^{th}$ century to 1996, the U.S.A led world steel industry with the technology of *open-hearth furnace*, *electric arc furnace*, and economy of scale, and continuous rolling machine. Until the early 1990s, Japan had been the leader with its technology of *Big blast furnace, LD converter, casting machines.* Presently, the world steel market is moving toward perfect competition with the development of globalization and liberalization. With the recognition of the importance of innovative steel technology, the speed of steel technology development is becoming faster and the technology cycle has shortened. Technology development within the steel industry is advanced predominantly in the areas of steel manufacturing process, finished steel products, and manufacturing environment. Manufacturing processes have become much more efficient through technology improvements. They have made energy reduction possible. New technology drove the steel industry to develop new products so that they could compete with aluminum and plastic products. Another significant change is that steel manufacturers can now operate their production facilities with improved environmental considerations. In the future, the

steel industry will undergo more dramatic changes due to new innovative technology such as *SRP (smelting reduction process)* and *Near Net Shape Casting*.

<Graph 1-1>The Relationship between Competitive Environment & Innovative Technology




Source : POSCO, "The Current Situation and Lookout of the Steel Industry and Innovative Steel Technology " 1997.5

**2). The Era of Competition**

**a) The Changing System of Competition in the World Steel Industry**

The World steel market is becoming more competitive. This high level of competition has made the steel business more difficult. The following are some of the reasons for the competitive steel market. Firstly, with regard to prospects in the medium to long-term, world steel demand is expected to increase, but the possibility of imbalance of steel demand and supply is expected to be very high due to the increasing steel production capacity of each country. Secondly, China, East Asia, Middle and South America, are likely to become new leading groups as they develop their steel industries. Thirdly, advanced countries such as USA, Japan, Germany, which lost their competitive advantages in the 1970s – 1980s, are recovering their competitive powers by restructuring.

Fourthly, because of *Thin Slab Casting technology* and *Direct Electric Arc Furnace technology*, Mini-mill produces flat products as well as long products. In accordance with this, it can be forecasted that future competition of the steel industry will be much more severe in securing profitability and flexibility of manufacturing via minimization of facility scales, and globalization, and diversification.

**b) Recovery of Competence in the Steel Industry of the Developed Countries**

The steel industry was lead by the developed countries until the 1970s, when, it experienced two oil shocks and a subsequent economic recession. However, after the down-turn, the steel industries of developed countries are now recovering their competitiveness, increasing their production capacities and steel product exports. They achieved this success through resolute rationalization, continuous cost-saving efforts and the development of new technologies. Since 1980, to regain competitiveness, Japan and the USA retired their old equipment, which made them improve their profitability. Due to this, they could improve their operating rates from 80% to 90%. Moreover, with the introduction of the autonomous facilities such as continuous casting, the ratio of continuous casting has been improved to 90% in 1996 from below 60% in 1980. Through the retirement of old equipment and with the introduction of autonomous facilities, they could save labor cost and, therefore improve efficiency greatly. During the period of 1980~96, Japan cut its steel industry labor force by about 50%. The USA also reduced its labor force by 65%. As a result, average work-hour per ton to produce flat steel in Japan was reduced to 4.24 in 1996 from 8.76 in 1980, achieving the best level in the world steel industry.

<Table1-1> Change of Main Indexes of Steel Industry between Japan and USA

| | Unit | '80(A) | | '96(B) | | B-A | |
|---|---|---|---|---|---|---|---|
| | | Japan | USA | Japan | USA | Japan | USA |
| Crude Steel Capacity. | M ton | 138.6 | 128.0 | 110.8 | 105.3 | -27.8 | -22.7 |
| Operation Rate of Steel Making | % | 79.3 | 80.4 | 89.2 | 91.1 | 9.9 | 10.7 |
| Continuous Casting Ratio | % | 59.5 | 20.3 | 96.4 | 93.2 | 36.9 | 72.9 |
| Work Force | Thousand | 375 | 399 | 189 | 138 | -186 | -261 |
| MH/T | - | 8.76 | 10.28 | 4.24 | 4.28 | -4.52 | -6.00 |

Source : World Steel Dynamics, *Steel Strategist* # 18-23, New York, 1992-1997

### c) Changes in the Steel Market after Development of Mini-mill

After the 1990s, one of the distinct changes in the world steel industry is electric arc furnace, that is, Mini-mill. In the USA, South Korea and Mexico the market share of Mini-mill products has been enlarged through replacing blast furnace products. Mini-mill producers are likely to keep enlarging their market shares because Mini-mill has many advantages: the small capital investment owing to adopting the electric arc furnace facilities and the superior production elasticity. As technology such as *direct current arc furnace,* and *shin slab casting,* became practical to use, flat production such as hot-rolled coils, cold-rolled flats, which could be produced only in the integrated steel plants in the past, could now be produced by Mini-mill technology.

## 3). Changes in Trading Patterns of the Steel Industry

### a) Changes in Trading Patterns of the Steel Industry

In general, trade in the world steel market is on the rise. This is due to the increase in

demand of developing countries, the growth of steel trades amount among developed countries, the innovation of logistics and distribution systems, and tariff reduction with the idea of free trade.

<Table1-2> The World Steel Production and Export (M ton)

| Year | Export (A) | Production (B) | Export Ratio(A/B,%) |
|---|---|---|---|
| 1950 | 20.5 | 192.0 | 10.7 |
| 1960 | 52.7 | 345.5 | 15.3 |
| 1970 | 116.1 | 595.3 | 19.5 |
| 1980 | 140.7 | 578.7 | 24.3 |
| 1985 | 170.4 | 598.2 | 28.5 |
| 1990 | 168.3 | 654.4 | 25.7 |
| 1992 | 177.6 | 620.2 | 28.6 |

Source : IISI, *World Steel* , Annual Report

As well as the increase in trade, structural changes are occurring in the steel market. First, trade within economic blocs are growing. More trade and transactions within an economic bloc make trade barriers high for those outside bloc.

<Table 1-3> Steel Trade Ratio by Region

| | Trend (%) | | | |
|---|---|---|---|---|
| | 1976 | 1986 | 1995 | 1996 |
| USA | 34 | 39 | 44 | 61 |
| E U | 58 | 56 | 71 | 67 |
| South Korea | 8 | 48 | 82 | 80 |
| Japan | 34 | 60 | 79 | 79 |

Note : In cases of Korea and Japan, Bloc means the area of East Asia

Source : Iron & Steel Statistical Bureau, *World Steel Exports*, London, Annual Issues

Second, Asia is becoming the center of the world steel trade. Between 1995 and 2005, the growth ratio of crude steel consumption in the developing Asian countries (except Japan) is expected to be 4% per annum, and market share is expected to become over 40%.

### b) Possibility of Trading Disputes and Current Trading Environment

Trade policies of each country need strategic adjustments in order to reduce the disputes arising from companies, countries, and problems caused by rapid progress of free trade, and globalization. Nowadays, each country is opening its market and reducing tariffs with its target to be duty-free by 2005, which is a WTO agreement. The idea of seeking liberalization of trade is distorted by market protection policy in each country, and high barriers among economic blocs. One of the noticeable changes in the world steel market is that trade related lawsuits, which used to be predominantly instituted by the USA, are increasing in South American and East Asian countries. This is because Russia began to increase its export of very low-priced steel products. The number of lawsuits against Russian steel companies increased rapidly from 1996. Most of the lawsuits against Russia are instituted by America, EU, South American countries, East Asian countries and South Korea. Consequently, the world steel market will be more competitive and difficult to understand because there will be more competitors, and therefore, more variables to calculate.

## 4) Globalization of Steel Industry

### a) Decrease in Strategic Importance of Steel Industry

One of the important reasons that the world steel industry is vigorously seeking

globalization is the relatively low strategic importance of steel industry. This means that the strategic importance of the steel industry as a national prestige industry or national defense industry has been weakened in accordance with the end of the cold war and advancement of industry structure. This change appeared with the privatization of government owned companies. The beginning of this was the privatization of *BS in U.K* in 1988. *Usinor, ILVA,* followed in Europe. Within developing countries, *CSN* in Brazil, *NASCO* in Philippines also became privatized. Thus, the ratio of privatizations in the steel industry in the Western world increased to 82% in 1995 from 69% in 1987.

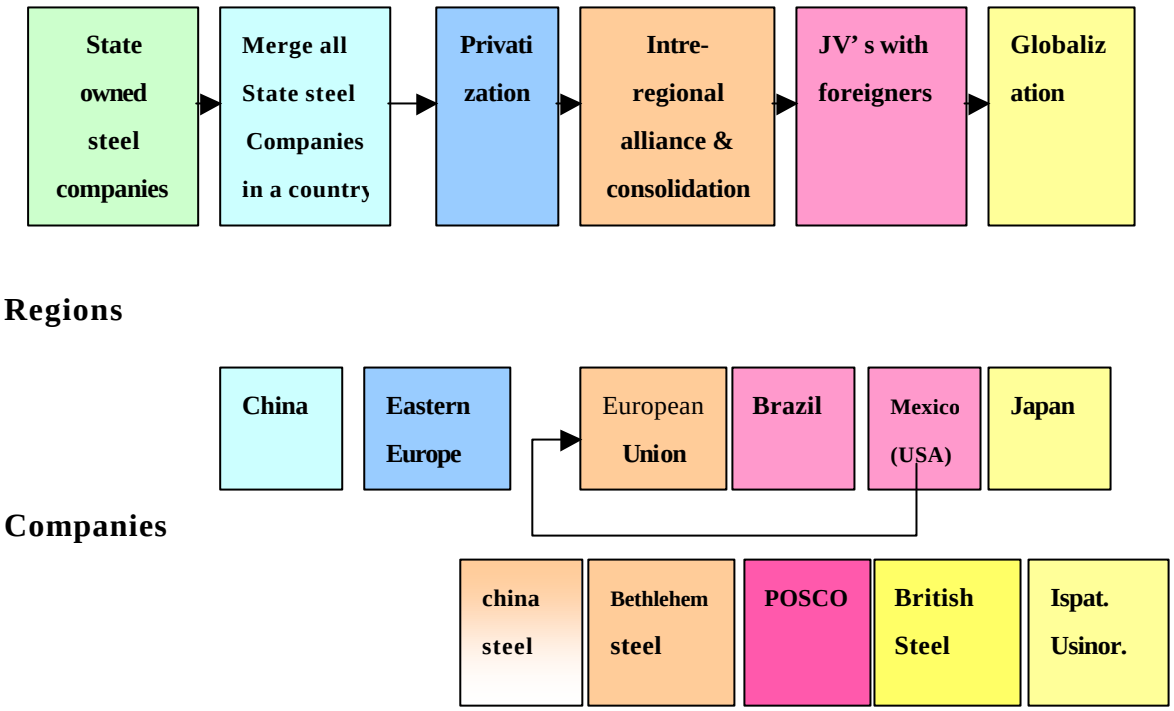
<Table 1-4> **Selected Steel Company Privatization**

| Company | Country | Year | Company | Country | Year |
|---|---|---|---|---|---|
| CAP | Chile | 1987 | Usinor | France | 1995 |
| British Steel | U.K | 1988 | Ispat Karmet | Kazakhastan | 1995 |
| Iscor | South Africa | 1989 | China Steel | Taiwan | 1995 |
| ISCOTT (Caribbean) | Trinidad | 1989 | Irish Ispat | Ireland | 1996 |
| Usiminas | Brazil | 1991 | Dalmine | Italy | 1996 |
| CST | Brazil | 1992 | Siderperu | Peru | 1996 |
| Ispat Mexicana | Mexico | 1992 | Sidor | Venezuela | 1997 |
| CSN | Brazil | 1993 | Aceralia | Spain | 1998 |

Source : J.P Morgan Securities Inc.

The companies that were privatized, pushed forward positively to make strategic alliances within companies for the purpose of attracting foreign capital along with liberalization of investment and financial markets, quickly resulting in globalization within the world steel industry.

<Chart 1-1> Stages of Steel Industry Development




Source : JPMS

Chart 1 outlines stages that countries and companies in the steel industry have made progressed so far. The first step towards globalization started with the merger of several state-owned companies in a country into one group. Most of the countries in the world already passed this stage. After that, the steel companies were privatized. New owners quickly rationalized facilities to maximize the potential of their initial investment. These operationally improved steel companies sought strategic alliances and consolidation opportunities to grow and protect their existing markets. After that, steel producers typically formed joint ventures with foreign partners in order to obtain technical know-how and gain access to new foreign customers. After these steps have done, globalization was usually the last step for the companies.

### b) World-Wide Proliferation of High Technology

It is true that historically there were high entrance barriers for the steel industry because huge amount of capital investment was required. However, as steel production technology became developed more and more, Mini-mill could build the low cost, high productive manufacturing system through simplification of the processes of works, and accordingly could decrease huge amount of capital investment.

### c) Cases and Patterns of Globalization

The mainstream of foreign direct investment is M&A. The other type is strategic alliance between companies. For strategic alliance, it is very important to harmony alliance partner's capability with its own strategy. Among all steel companies in the world, Japanese steel makers have globalized through strategic alliance. Meanwhile, M&A is used to acquire the economy of scale and to expand market share rapidly. One of the typical companies that have applied M&A strategy most sprightly is the *Ispat International N.V* that constructed the global production bases in six countries through taking over steel companies, which were in the process of privatization from government owned companies

## 2. Forces at Work

For all that movement of technology has been relatively vigorous among prominent world steel companies through licensing or trading for several decades after World War II, it was very rare case that a steel making company operated its production facilities in many countries. It was because that each country fostered its steel industry as its own mainstay industry through its industrialization efforts. However, globalization of capital investment in the steel industry made a new start since 1970s, and this trend has been accelerated much more after 1980s. Following factors influenced the steel industry globalization: structural changes of the steel industry itself; globalization of steel-demand industry (example, globalization of automobile industry).

The companies in developed countries such as the USA, Japan, Germany, France, and U.K could not help going through reorganization after early 1970s. These integrated steel companies that produced a wide range of steel products at that time experienced a sharp drop of operating rates of facilities, and had a hard time in arranging extra facilities due to the entry of Mini-mill and the steel supply enlargement of the other OECD areas. Consequently, consolidation has been proceeded within companies in the world steel industry, and they also focused their efforts on producing such products as high value–added and high technology needed. The huge capital investment in technical innovation was necessity in order to make steel products high value added. Thus, joint venture was considered more an appealing alternative rather than the single investment of capital in facilities and technology. Besides, the world steel producers have driven diverse strategies aiming to assure competitiveness copying with the changes of steel industry-environment.

One of these strategies is the globalization strategy. This strategy has been taken under development of steel technology, changes of steel market conditions, relaxation of government regulation, and changes of international investment-environment.

Generally, the strategic motivations for globalization can be classified as follows. 1) The market expansion through strategic alliance with steel demand-industry; this was a typical strategy of Japanese steel makers. 2) New overseas market development with its own effort. 3) Foreign investments; this acquired economic efficiency of investment, and synergy effect in the process of steel industry reorganization. 4) Global outsourcing for obtaining raw materials that was not sufficient in its country. 5) Cost reduction, or profit enhancement through building steel material supply basis such as scrap substitutes, raw materials. 6) Tariffs and the other duties reduction. 7) Minimal government regulations regarding taxation, competition, environmental standards, and procurement. 8) Enhancement of capability in distribution and sales. 9) Acquirement technical and marketing capabilities.

## 3. Regional Overview

### 3-1. North America

In the case of the integrated steel industry, the international FDI (Foreign Direct Investment) and alliance have been mainly generated between Japanese steel producers and US producers in North America. In 1981 almost all US steel producers had already made an agreement with Japan on receiving technical support. For instance, *US Steel (USS)* made an agreement with *Nippon Steel* on the synthetic technical support, and an agreement with *Sumitomo metal company* on the technical support for cold-rolled and continuous casting. *Bethlehem Steel* also, was provided with technical assistance for enhancement of productivity by *Nippon Steel and Kawasaki Steel*, and *Inland Steel* was provided with technical support for converters by Nippon Steel. *Armco* was also provided with work plant diagnosis by *Nippon Steel*. In the middle of 1980,the technical alliance between Japan and US has been developed to the level of sharing stocks between the two countries' steel producers; *NKK* acquired 50% of *National Steel's* stocks in 1984,and expanded to 74% in April, 1993. This technical alliance between these two countries was attributed to the influence of globalization of Japanese automobile industry in 1980s. Also Mini-Mills was not an exception to globalization, so the success of the US Mini-Mills has accelerated FDI and cooperation from Japan and Europe through contacts. In addition to integrated steel mills and Min-Mills, globalization also accrued in the non-cored area of the steel industry. That is, the "service center" was responsible for the following roles; purchasing the steel product from the integrated steel mill or Mini-Mill, and processing them according to the demands of end users. In this area the advance of Europe stood out prominently, and Sweden and Germany went into this industry early, followed by the

trader of Japan.

### 1) U. S. Steel Group

USX Corporation's U.S Steel Group (USS) is the largest steel producer in North America, at 12.35 million tons of raw steel production in 1997. It is also arguably the most internationally aligned producer in the United States, as it has several joint ventures (both in the United States and abroad) with foreign partners. The aim of USS's international joint ventures (and with its domestic ventures as well) is to enhance profitability, diversify risk wider geographical and product lines, share capital resources and technology, and develop new market and customers. U.S. Steel is also focusing on the improvement of its existing franchise, to obtain higher earnings growth. The three elements to this strategy are to boost performance of existing operations, to serve value-added markets, and to improve the balance sheet. Capital investments, largely to improve operations and the product mix, reached about $340 million in 1998. These include a reline of the *Gary No.6* blast furnace and improvements to a *Gary* coke battery, expansion of a galvanizing line at *Fairless Works*, and conversion of the tube mill at *Fairfield* from blooms to rounds. Capital expenditures amounted to $261 million in 1997, with such major projects as a blast furnace reline at the *Mon Valley Works*, a new $40 million heating-treat line at the 160-inch plate mill at *Gary*, and environmental spending at *Gary*. The company's financial obligations declined by $567million in 1997, reflecting the cash provided by operations and asset sales. In April 1997, U.S. Steel Group announced the sale of a stake in three coke batteries at its *Clariton Works* to two undisclosed limited partners for approximately $360million. The three batteries produce about 1.5million tons of coke

annually. In total, *Clariton* has 12 coke batteries (with more than 800 ovens), which produce 6.8 million tones of coke annually. U.S. Steel Group, a unit of USX Corp., includes U.S. Steel, the nation's largest steel producer in terms of annual crude steel production. It is engaged primarily in the production and sale of a wide range of steel mill products and raw materials (coke and taconite pellets).

U.S Steel has a 9.6% market share of the finished steel apparent consumption in the United States and an 11.4% share of finished steel shipments by U.S. producers. U.S. Steel has four primary facilities: *Gary Works in Indiana, Fairfield Works in Alabama, Mon Valley Works in Pennsylvania, and Fairless Works in Pennsylvania (near Philadelphia).* The Fairless Works is a finishing mill only; the former three are fully integrated facilities. U.S. Steel Group also includes the management of mineral resources, domestic coal mining, engineering and consulting service, and technology licensing. Other businesses include real estate development and management, fencing products, leasing and financing activities, and a majority interest in a titanium metal products company. Headquartered in Pittsburgh, PA. U.S. Steel Group employed an average of 20,276 people in 1998. Joint Ventures (JVs) are essential facet of the vision strategy. Among their many advantages, JVs enhance US Steel's position with existing customers, create access to new customers, target emerging markets, provide an acceptable level of risk, offer synergies with US Steel's core facilities and provide a favorable rate of return.

**VSZ U.S Steel**

In November 1997, U.S. Steel announced plans for a 50/50 joint venture in *Kosice, Slovakia*, with VSZ a.s. for the production and marketing of tin products to emerging

central Europe. It was known that U.S. Steel's investment was reached about $60 million. In February 1998, the joint venture assumed ownership and commenced operation of an existing tin mill facility (VSZ's *Ocel plant* in *Kosice*) with an annual production capacity of 140,000 metric tons. The joint venture plans to add 200,000 annual metric tons of tin mill production capacity in the next two years. This is the second international joint venture for U.S. Steel. Its first was *Acero Prime*, a steel processor and warehouse in *San Luis Potosi*, Mexico, with 112,000 metric tons of annual capacity.

**USS-POSCO Industries (UPI)**

This is a joint venture between USX and *Pohang Iron & Steel Co., Ltd* (POSCO) of South Korea that owns and operates the former U.S. Steel Pittsburg, CA, plant. The joint venture markets high-quality cold-rolled sheets, galvanizing sheets, tin plate and tin-free steel, principally in the western United Stated market area. USS-POSCO's annual shipment capacity is 1.4million tons, with hot bands principally provided by U.S. Steel and POSCO. Total shipments were approximately 1.7 million tons in 1997.

**USS/Kobe**

USX and Kobe Steel Ltd. of Japan participated in a joint venture that owns and operates the former U.S. Steel Lorain, Ohio Works. The joint venture operates a blast furnace and manufactures bar and tubular products. Bar products are sold by USS/Kobe, while U.S. Steel has sales and marketing responsibilities for tubular products. USS/Kobe's annual raw steel capacity is 2.6 million tons, with iron ore and coke provided primarily by U.S. Steel. Raw steel production was approximately 1.9 million tons in 1997, with total shipments of approximately 1.6 million tons.

**PRO-TEC**

This joint venture between USX and Kobe owns and operates a hot-dip galvanizing line in *Leipsic*, Ohio, geared towards the automotive and construction markets. The facility commenced operations in early 1993. Capacity is 600,000 tons per year, with substrate coils provided by U.S. Steel. PRO-TEC produced 671,000 prime tons of galvanized steel in 1997. In early 1997, USX and Kobe began construction of a second hot-dip galvanized sheet line at PRO-TEC with a yearly capacity of 400,000 tons. Startup of operations was projected for the third quarter of 1998.

**Double Eagle Steel Coating Company**

USX and *Rouge Steel Company* participated in a joint venture that operates an electro-galvanizing facility in Dearborn, Michigan, focusing on automotive applications. Capacity is 870,000 tons annually, with availability of the facility shared equally by the partners. In 1997, *Double Eagle* produced approximately 853,000 tons. Besides, **Olympic Laser Processing,** in 1997, U.S. Steel Group and *Olympic Steel* formed a 50/50 joint venture to process laser-welded sheet steel blanks. U.S. Steel has a 46% equity interest in **Transtar**, which was formed in 1998 via the purchase of the domestic transportation businesses of USX, including railroads, a dock company, USS Great Lakes Fleet Inc., and Warrior & Gulf Navigation Company. Blackstone Transportation Partners and Blackstone Capital Partners together own 53% of Transtar. USX owns a 27% interest in **RMI Titanium Company**, a leading producer of titanium metal products. In 1996, 6.9 million shares of RMI common stock were sold in a public offering at a price of $18.50 per share, or $121 million. Of this, USX sold 2.3 million shares and netted $ 40 million. Also in December

1996, USX issued $117 million of 6 3/4% Exchangeable Notes due February1, 2000, convertible into USX's remaining interest in RMI common stock. The debt's carrying value is adjusted quarterly to reflect changes in the value of RMI common stock.

AS such, USS recognizes the importance of cooperation among companies within the industry in order to maintain competitiveness in the long run, especially under the WTO system which promotes borderless competition. In order to cope with the unprecedented competition in the 21st century, USS plans to make further efforts to strengthen global management, forge strategic alliances and create joint venture in line with its global management strategies.

< Table 2-1> U.S Steel Group, Income Statement, 1993-1998 (U$ million)

| | '93 | '94 | '95 | '96 | '97 | '98 |
|---|---|---|---|---|---|---|
| Net sales | 5,611 | 6,066 | 6,463 | 6,547 | 6,901 | 6,283 |
| Total cost & expenses | 5,761 | 5,753 | 5,974 | 6,187 | 6,168 | 5,704 |
| Operating Income | (149) | 313 | 488 | 360 | 733 | 579 |
| Net Income | (169) | 201 | 303 | 275 | 452 | 364 |
| EPS (U$) | (4.04) | 2.35 | 3.53 | 2.98 | 5.24 | 4.05 |

Source : Company Report

**2) Nucor Corp**

Nucor is the largest mini-mill in the United States and one of the lowest-cost steel producers. Its main business is the manufacture of steel and steel-related products, including flat and long hot-rolled steel (sheet and coil, angles, channels, and pilings), cold-finished steel, steel joists and joist girders, steel deck, and steel grinding balls. With

headquarters in Charlotte, North Carolina, Nucor had a total of 7,200 employees at the end of 1998. Its shares are listed on the New Stock Exchange. Nucor has constructed all of its plants at Greenfield sites. Management has been the world's leader in commercializing new steel-making technology to lower costs and expands its production capacities and product mix.

**Management Philosophy**

Nucor is known for its strong emphasis on employee relations, quality, productivity, and technological leadership. With a streamlined organizational structure, incentive-based compensation systems, rigorous quality systems, and with its aggressive pursuit of innovation and technical excellence, Nucor is able to attract and retain highly talented, productive and dedicated employees. Nucor is proud of the more than 7,000 employees that make up the total Nucor team. Employee relations at Nucor are based on four clear-cut principles: 1) Management is obligated to manage Nucor in such a way that employees will have the opportunity to earn according to their productivity. 2) Employees should be able to feel confident that if they do their jobs properly, they will have a job tomorrow. 3) Employees have the right to be treated fairly and must believe that they will be. 4) Employees must have an avenue of appeal when they believe they are being treated unfairly.

**Technological Leadership**

Nucor's strong emphasis on employee communication and commitment carries with it the commitment to provide the work force with the best technology available to get the job done right in a safe working environment. As evidence of that commitment, Nucor

aggressively pursues the latest advancements in steel making around the world to determine what technology it can adapt in its facilities. This pursuit of technical excellence lead to the joint venture with Yamato Kogyo of Japan to build *Nucor-Yamato Steel Company* in 1988. At Nucor-Yamato, Yamato-Kogyo's technological expertise in structural beam blank casting was successfully combined with Nucor's management philosophy and talented personnel to build one of the premiere structural steel mills in the United States. In addition, the Nucor Steel sheet mills in Indiana, Arkansas, and South Carolina represent a revolution in the thin slab casting. Nucor was the first "Mini-mill" to successfully commercialize the technology developed by a company in West Germany.

**Product Mix and Markets**

Nucor Steel has six Mini-mills, all continuous casting: Four produce long products, like bars and light structures (Darlington, South Carolina; Norfolk, Nebraska; Jewett, Texas; and Plymouth, Utah), and two produce sheet (Crawfordsville, Indiana, and Hickman, Arkansas). The Crawfordsville plant, started up in 1989, was the first Mini-mill in the world to use *thin-slab casting technology* to produce flat-rolled products. Called "compact strip production," it was the first commercially viable process in which molten steel was cast into thin slabs (about two inches thick) and then rolled into hot bands in one continuous process. After the success of the *Crawfordsville plant*, a second Greenfield plant was constructed in Hickman, Arkansas, and began operation just 15 months after breaking ground in 1992. The two sheet-mill facilities have aggregate annual production capacity of 4 million tons.

A third sheet-steel Mini-mill was constructed in Berkeley Country, South Carolina (near Charleston), for about $ 500 million; it has annual production capacity of 1.8 million tons and started up in early 1997. Nucor-Yamato Steel has Nucor's seventh mini-mill (in Blytheville, Arkansas) and is a joint venture of Nucor (49%) and Yamato-Kogyo in Japan (51%). The plant produces I-beams, wide-flung beams, H-piles, and other heavy structural steel products and competes directly against the integrated steel producers. Nucor plans to contract a new 1,000 thousand tons-per-year steel mill to produce steel plate in Herford Country, North Carolina. The new facility is anticipated to cost more than $ 3million. Nucor's capital expenditures in 1998 were $502.9 million and are presently projected to be over $ 425 million in 1999. These expenditures expand Nucor's production facilities and also help to keep Nucor's present facilities modern and efficient. The phrase of "Multilateral Strategic Alliance & Globalization" represents NUCOR's domestic and global strategies: Preparing for the ever-intensifying competition in the 21st century based on its accumulated success. It plans to establish a thin-Slab factory in Thailand with the annual production capacity of 1.5 million tons in alliance with NSM to make inroads into the Southeast Asia market. It is a good example of Related Diversification & Vertical Integration of Business.

<Table2-2> Nucor Corporation, Annual Income Statement, 1994-1998 (U$ million)

| | ' 94 | ' 95 | ' 96 | ' 97 | ' 98 |
|---|---|---|---|---|---|
| Net Sales | 2,976 | 3,462 | 3,647 | 4,185 | 4,151 |
| Total Cost & Expe' | 2,619 | 3,030 | 3,259 | 3,724 | 3,736 |
| Net Earning | 227 | 275 | 248 | 295 | 264 |
| EPS (U$) | 2.60 | 3.14 | 2.83 | 3.35 | 3.00 |

Source : Company Report

### 3-2.Europe

Globalization of the steel industry in Europe has been limited to mainly the sphere of the EU. The interchange among the countries in Europe has been taken the shape of joint venture for the production of the special steel products. There were a lot of steel makers, which have combined their productions and distribution facilities in adjacent countries. Globalization of the European steel industry developed together with the trend of the unification of Europe, and in particular was applied in the field of production, marketing and R&D. From Usinor-Sacilor down, the steel makers in Europe have made an agreement with other companies on the joint ventures, or the establishment of service-centers.

#### 1) British Steel

British Steel is the world's sixth-largest steel producer, shipping more than 16 million tons annually from four integrated steel works (Llanwern, Port Talbot, Scunthorpe, and Teeside) and several other steel-producing ventures. It accounted for 57% of the U.K market for finished steel products. Unlike most of its European competitors, British Steel has been private for a number of years (since December 5,1988). As a result, the company has successfully executed extensive operating and financial programs, which have transformed it into one of the lowest-cost integrated producers with negative net debt and an over-funded pension plan. The principal trading market for the common shares is the London stock exchange, while the ADRs are listed on the NYSE and Toronto stock

exchange. As of 1998, there were 46,500 employees in the worldwide. British steel maintains its head office in London and operates production sites on the European Continent, in North America, and in Asia. In December 1995, British Steel closed its seamless tube plant, marking the company's exit from the seamless tube production. As result of shutdown, 520 employees were laid off. In November 1995, British Steel announced that it would defer the rebuilding and relining of its largest Blast Furnace. The delay in the overhaul was expected to generate saving of £50 –150 million. At the beginning of 1996, British Steel announced it would invest £70 million to modernize its Teeside and Scunthorpe works. The modernization, which would replace ingot production by continuous casting, was expected to raise product quality and reduce production costs. The company has also invested £60 million on a heavy section mill and a new arc furnace and on improvements to a slab caster.

In April 1996, British Steel set up high-tech distribution center in the west midlands to make just in–time deliveries to the automotive industry. The distribution center costs £13.5 million and has fully operated in the later half of 1996. The equipment at the distribution center includes a press for stamping doors and other parts, and laser-guided cutting and welding machines. The investment helped British Steel increase the added value in its products and to enhance communications with its customers in the automotive industry. In November 1992, British Steel merged its stainless steel business with *Avesta AB* of Sweden to increase one of the largest European stainless steel producers, *Avesta Sheffields*. British Steel retained a 40% interest in Avesta Sheffield, which is quoted on the Stockholm Stock Exchange. In September 1994, British Steel brought its total ownership of *Avesta Sheffield* to 49.9% and further increased it to 51%

## Globalization

The company has two flat-rolled carbon steel Mini-mills in the United States: The first is an 800,000-tonne coil plate facility at Tuscaloosa, Alabama; the second is a 2.2-million-ton sheet mill that is a joint venture with LTV Corp. and Sumitomo. They started production in late 1996 and early 1997, respectively. As part of the projects, British Steel relocated two DRI units to Alabama with total capacity of 900,000 tons. The DRI facilities started up at the end of 1997. Moreover, in September 1997, the company agreed to take a one-third stake in a steel tube manufacturer, *Euro-pipe GmbH,* which is currently a 50/50 joint venture between Germany's Steel on the divestiture of Sogerail-Usinor's railtrack production unit, which had 1997 sales of EUR 170 million (£ 185 million)

## Ownership Structure

The UK.Steel industry has undergone substantial restructuring since World War II. British steel was formed in 1967 from major UK.Steel producers. In December 1988,the government privatized the company in an offering made in U.K, the United States, Canada, Europe, and Japan. In general, there are no restrictions on foreign ownership of British Steel. No specific UK laws or regulations restrict or affect the transfer of capital or payment of dividends, interest, or any other payments to U.S citizens or residents who are British steel stockholders. However, any one who has a material interest in the share capital equal to or in excess of 3%, or who has interests (material or not) equal to or in excess of 10%, is required to disclose that interest to the company.

<Table2-3>British Steel, Consolidated Income Statement, 1994-'99E (£ million)

| | '94 | '95 | '96 | '97 | '98 | '99E |
|---|---|---|---|---|---|---|
| Turn-Over | 4,191 | 4,784 | 7,048 | 7,224 | 6,947 | 6,213 |
| Operating Costs | 4,075 | 4,338 | 6,107 | 6,848 | 6,682 | 6,474 |
| Net Profit | 70 | 471 | 826 | 307 | 233 | (260) |

Source : Company Report

**2) Ispat International N.V.**

Ispat International is a global steel producer with production operations in six countries: Mexico, Trinidad and Tobago, Canada, Germany, Ireland, in addition to the United States, which it has just recently entered through the acquisition of *Inland Steel Company*. For the past six years, Ispat has achieved significant growth primarily from strategic acquisitions of under-performing, mostly government-owned assets around the world and turning them around through focused capital expenditure programs and implementation of better management practices. As a result, from 1992 to 1997 its steel shipments rose 37% per annum (from 1.5 million to 7.1 million tons) and sales increases by 47%, making Ispat one of the world's fastest-growing steel producers. Ispat's consolidated shipments would be reached 15.5 million tons in 1999, reflecting the acquisition if *Inland*. Ispat benefits from a broad geographic sales horizon and product base. Ispat produces a wide variety of steel products, including slabs, hot-rolled sheet, cold-rolled sheet, coated sheet, wire rod and structures. These products are sold to a wide range of world industries, including engineering, construction, automobile, and aircraft. With all of its steel-making facilities located near deep-water port facilities, Ispat has historically focused on the export market and has been able to shift its marketing focus to other markets as they become " hot." In

addition to steelmaking facilities, Ispat has iron ore mines (Mexico), iron ore pelletizer, direct reduced iron (DRI) plants, tube and wire making facilities, as well as ships and port handling assets. These assets provide Ispat with reduced production costs and provide the company with captive outlets for a portion of its steel production. Ispat is one of the lowest-cost, highest-quality steel producers in the world, as its plants employ the steel-making platform of the future: the integrated Mini-mill. Its plants enjoy captive, high-quality raw materials (primarily DRI, a scrap substitute) and a flexible, low-cost structure (electric arc furnace steel making). Ispat's plants also benefit from captive deep-water port facilities, automated raw material handling system, large electric arc furnaces with continuous casters, and finishing lines. Besides its prowess of creating value through acquisition, Ispat has technical skills that are exceptional in the industry. It is the only steel producer in the world of using 100% DRI in the production of steel, and has experience with both types of DRI technology (*HYL and Midrex*). Ispat currently utilizes 75% DRI in the production of steel. Furthermore, Ispat is the world's largest producer and consumer of DRI. In August of 1997, the founding shareholder, *Lakshmi N. Mittal*, sold 20% of the company in an initial public offering. The company only issued Class A common shares to the public, while the *Mittal* family maintained control of all of the Class B shares (which entitles the holder 10 votes per share). As a result, the *Mittal* family controls 96.8% of the combined voting power of the outstanding shares.

**Product Mix and Markets**

Ispat is the only truly global steel producer, with facilities in Mexico (8% of consolidated net sales in 1997), Canada and Ireland (30%), Germany (20%), and Trinidad (12%). The

geographic diversification of Ispat's plants, along with a diverse product base and markets in 63 countries, enables Ispat to diminish the impact of geographical and product market downturns. Most other steel producers are home market forced and few have steelmaking facilities located outside of their home market. In 1997, about 50% of Ispat's production was sold outside the country of production, with North America and Europe as the key markets. We believe Ispat possesses the ability to redirect sales to more profitable regions as the market dictates, given that all of its plants are located near deep-water port facilities and its products are of high quality. Ispat's Mexican and Caribbean subsidiaries are the main drivers of earnings, given their growing capacity levels, high internal DRI utilization, as well as low material and labor costs. Imexsa and Caribbean Ispat contributed 62% of Ispat's consolidated gross income in 1997, despite the fact that their sales represented only 50% of the total. The slab and wire rod markets are Ispat's most important markets-representing about two-thirds of its revenue in 1997. Slab production is based solely in Mexico, where Ispat produced 3.2million tons in 1997. Through its capital expenditure program, Ispat should increase slab production to 4.4million tons by the end of 1999/early 2000. Ispat exported 71% of its products to the U.S. and Canadian markets in 1994, as prices were high. However, as price started to decline in the region in the second half of 1995, Ispat shifted its sales to Europe. As a result, sales to the United States and Canada declined to 55% of total sales, while sales to Europe increased to 23% from 1% (part of this increase was also attributable to the acquisition of IHSW, which sells most of its products in Europe). In 1996, as prices in North America start to rebound, Ispat increased sales to 58% in the region.

**Strategy**

Ispat's remarkable growth has relied heavily on acquisitions of state-owned steel operation via privatization. However, as most governments have already privatized their steel sectors, limiting Ispat's traditional acquisition targets, Ispat is forcing on its efforts to make significant gains via private-sector acquisitions such as its September 1997 purchase of Thyssen's Long Products division in Germany and recent acquisition of Inland steel company in the United States. It is expected that Ispat would be remained the main consolidator of steel assets in the world, given its high insider ownership structure and proven track record. Ispat is likely to continue to do strategic/opportunistic acquisitions in Latin America and in the United States and to continue to participate in European consolidation/divestitures of long products.

Ispat is in the enviable position to expand its production capabilities at significantly lower costs than would be associated with typical Greenfield projects. Capital expenditure programs are an internal part of Ispat's strategy to increase internal capacity and further reduce production costs. During 1997, Ispat completed a significant portion of its $600million, Phase 1, CAPEX program directed at the Mexican and Caribbean subsidiaries. The program: 1) expanded upstream integration into raw material sourcing; 2) increased steel production capacities of both facilities; 3) further reduced cash costs of production; 4) made environmental improvements at CIL. Furthermore, Ispat has initiated the $215million second phase of its capital expenditure program that aims at further increasing capacity at Imexsa and increasing productivity and reducing costs at its German operations.

<Table 2-4> Ispat International Ltd., Income Statement, 1994-1999E (U$ million)

| | '94 | '95 | '96 | '97 | '98 | '99E |
|---|---|---|---|---|---|---|
| Net Sales | 735 | 1,828 | 1,860 | 2,190 | 3,460 | 4,420 |
| COGS | 549 | 1,323 | 1,467 | 1,707 | 2,825 | 3,748 |
| Operating Income | 94 | 328 | 198 | 255 | 358 | 351 |
| Net Income | 246 | 556 | 613 | 289 | 275 | 123 |

Source : Company Report

### 3-3 Asia

Globalization of the steel industry in Asia has also happened mostly within the Asian zone. Foreign direct investment and technical aid has been made from Japan, South Korea and Australia to China, Vietnam, Indonesia, Malaysia and India. In particular South Korea and Japan have expanded their export markets in accordance with the rapid industrialization of the developing countries. The steel makers and synthetic traders of Japan found large market in Malaysia and Thailand, and South Korea also launched in the foreign market of China and Vietnam, etc. In addition Taiwan has advanced in Malaysia, China, etc, and strengthened its cooperation with Germany and South Korea for the production of value added products. India, which has been aided by technical services from Germany, Japan and Russia since it operated it's facilities as a type of government owned steel company, more recently set about for it's joint ventures with the USA and other countries.

#### 1) Nippon Steel Corporation.

Nippon Steel Corporation, the world's largest steel maker, has the second-largest exposure to steel sheet products after *Kawasaki Steel* and the most diversified product mix among

the five largest Japanese steel makers. Besides steel making, Nippon Steel also produces titanium, chemicals, and semiconductors; develops electronics and information/ communication system; and engages in civil engineering and marine construction. Currently 80% of the company's non-consolidated sales is derived from the steel-sector. Established in 1950, Nippon Steel is listed on the Tokyo, Osaka, and Nagoya stock exchanges in Japan. The workforce totaled 24,527 as of March 31,1997,down from 34,619 at fiscal1994 year-end. Nippon Steel has 10 steelworks throughout Japan, with iron and steel making facilities concentrated at four locations - *the Yawata, Nagoya, Kimitsu, and Oita works.* During fiscal 1996, Nippon Steel worked out and implemented a strategy designed to respond to market trends under a single, unified system integrating, by product, the whole of manufacturing, marketing and research, and development resources. Furthermore, net annual cost savings targeted and achieved over the three-year period of the Medium-Team Business Plan totaled ¥ 300billion in all steel divisions on a non-consolidated basis. In response to deteriorating domestic steel market conditions - as sales of homes and automobiles remain weak, and as exports to Asia, its largest overseas market, are tumbling following Emerging Asia's financial crisis in late 1997 - the company has decided to cut steel production by approximately 2.5% (or 640,000tonnes) during 1998.

**Product Mix and Markets**

Nippon Steel's major product lines include rails, sheet piles, H-beams, bars, wire-rods, plates, hot-and cold-rolled sheets, surface-treated sheets, pipe and tubes, and stainless steel. In fiscal 1997, flat-rolled sheets and plates constituted 63% of all steel shipments, while tubular and others represented 28%, and sections 9%. In fiscal 1997, the company

shipped 25.9million tons of steel, equivalent to net sales of ¥ 2,185billion (or 80% of non-consolidated sales). Major subsidiaries are Nippon Steel Metal Products (83%-owned), Osaka Steel Co.(54.9%),Daido Steel Sheet Corporation(50.7%),NS T(100%), and NS Kote (100%). Net sales from the Engineering sector represented 17% of non-consolidated sales, and net sales from the Chemical and other sector represented 3%. Exports accounted for 24% of non-consolidated sales.

**International Operation**

Having established manufacturing gases in North America during the latter half of 1980s, Nippon Steel shifted the focus of its overseas business development activity in the 1990s to South Asia and China. In the United States, Nippon Steel and Inland Steel Company (now owned by Ispat International) set up a joint venture, I/N Tek, in 1987. The operation, 40%-owned by Nippon Steel, has annual finishing capacity of one million tons. Then, in 1989, the same partnership established I/N Kote to produce high-grade coated sheets using continuous hot-dip galvanizing and electro-galvanizing lines. I/N Kote is 50%-owned by Nippon Steel and has annual capacity of 900,000 tons. These joint ventures have allowed Nippon Steel to aid in meeting the local procurement needs of Japanese automobile makers in North America for high-grade cold-rolled and coated steel products. In December 1994, Nippon Steel established two joint ventures in China. One is Guangznou Pacific Tinplate Co.,Ltd., which began operations in 1997 and has the capacity to produce 120,000tonnes of tinplate annually. The other is *Nantong Baogang* & Nippon Steel Co. Ltd., which produces steel bars employing the electric furnace steel-making process. This venture has an annual capacity of 240,000 tons and began operations in November 1996. Two joint ventures were established in Thailand in 1995.

One, *the Siam United Steel (1995) Co. Ltd.*- scheduled to go on-line at the end of 1998 – had an annual capacity of one million tons of high-grade cold-rolled steel sheets for use in production of tinplate, automobiles, and home appliances. The other venture, Siam Nippon Steel Pipe Co., Ltd., began operations in January 1996, primarily producing steel pipe and tubes for automotive machine structures, with annual capacity of 20,000tonnes.

**Ownership Structure**

Ten Japanese corporations own 26% of Nippon Steel's outstanding shares, including Nippon Life Insurance (3.9%), Mitsubishi Trust (3%), Industrial Bank of Japan (3%), and Mitsui Trust (3%), there are no particular restrictions on foreign ownership, except that the Securities and Exchange Law requires that foreign ownership in excess of 5% be reported to the Ministry of Finance. Foreigners hold about 7% of outstanding shares, and approximately 25% of total shares are held by investors owning 50,000 shares or less.

<Table 2-5> Nippon Steel Selected Financial Data (¥ million), non-consolidated

| | '95 | '96 | '97 |
|---|---|---|---|
| Net Sales | 2,090,580 | 2,099,750 | 2,184,805 |
| Operating Income | 77,627 | 125,066 | 128,527 |
| Net Before Tax | 10,438 | 25,741 | 20,406 |
| Total Assets | 3,299,979 | 3,145,269 | 3,145,249 |

Source : Company Report

**2) NKK Corporation.**

NKK Corporation is the world's fifth-largest steel maker and ranks second in Japan, behind Nippon Steel. Founded in 1912 as Japan's first manufacturer of seamless pipes,

NKK has expanded into steel making, shipbuilding, steel fabrication, construction, industrial machinery, and engineering. In recent years, NKK has diversified to take advantage of emerging opportunities fostered by the structural changes in Japan's economy. The company entered into new fields of business, such as electronics, advanced materials, urban development, and computer systems. NKK currently has two main divisions, Steel making and Engineering; the latter comprises plant, energy, environmental engineering, construction, and urban development. NKK-listed on the Tokyo, Osaka, and Nagoya stock exchanges- maintains its principal office in Tokyo. In fiscal 1997, net sales from the steel division represented 61% of total non-consolidated net sales. NKK has six domestic steel works: *Keihin, Fukuyama, Toyama, Tsurumi, and Shimizu*. In fiscal 1997, NKK completed its three-year strategic restructuring program, which implemented a wide range of cost-reduction measures, including reduced consumption of energy and other resources, a smaller workforce, and the consolidation of production activities in the Steel and Engineering divisions. From 1992 to the end of fiscal 1996, NKK eliminated 50 departments and 125 sections, and achieved personal reductions of 7,500 employees, translating into cost reductions totaling ¥200 billion. Upon completion of the restructuring program, NKK announced in March 1997 a new three-year management plan, whereby the firm pursued the following initiatives: strategic sales activities exploiting product strengths and diverse range; cooperation among divisions and marketing of key construction projects to increase steel product appliances; close coordination between manufacturing and sales departments to further upgrade product quality, delivery times, and cost-competitiveness; stepped-up exports to Asian markets and material supplies to NKK's Thai joint venture to stimulate operations in Asia; and active promotion of short-term projects tied to plant operations and next-generation R&D projects, including basic

research on new process. Recently, NKK announced plans to reduce steel production in 1998, as domestic demand continues to decline, given weak sales of homes and automobiles, and as exports to Asia (its largest overseas market) tumble. The company also stated that it is stopping production of hot-rolled stainless steel sheet because of excess supply and low demand in Asia. Instead, the company would focus on steel plate and stainless-clad steel, which are used in construction. The decision to stop stainless sheet sales production reflects weak demand by automobile producers, which account for more than a third of sales of stainless sheet, used to make exhaust pipes. In May 1998, NKK announced that it is pulling out of the computer memory microchip business, which has been unprofitable.

**Asset and Product Mix**

Steel products sales accounted for 61% of NKK's total non-consolidated fiscal 1997 sales on shipments of 10.2 million tons. NKK's steel products include carbon, alloy, and stainless pipes and tubes (an area in which NKK excels); plate; hot-and cold-rolled sheet; surface-treated sheet; and bars and shapes. Major markets are the construction, automotive, shipbuilding, railroad, and electro-conductor industries. NKK has the second-highest exposure to pipes and tubes among the top-five steel producers in Japan, representing 16% of net non-consolidated steel sales in fiscal 1997. Net sales from plates and sheets accounting for 71% of net non-consolidated steel sales in fiscal 1997, while bars and shapes represented 7%. Exports represented 21% of net steel sales.

**International Operations**

NKK has major overseas joint ventures in Asia, the United States, Europe, South America,

Africa, Australia, and the Middle East. Among other holdings, NKK has a 67.6% voting interest and a 51.5% economic interest in National Steel in the United States. It is also the partner of *National Steel* and *Dofasco Inc.* of Canada in the operation of a continuous galvanizing line at DNN Galvanizing Corp. In Canada, which also makes hot-dipped galvanized steel sheets for automobiles. In Southeast Asia, NKK owns 40% of Thai Coated Steel Sheet Co., NKK's first electro-galvanized sheet production base in the region. In 1996, NKK announced its agreement to enter into a joint venture with Vietnam Steel Corporation to build a crude steel plat in Vietnam's northern Quang Ninh. The plant had an annual capacity of 500,000 tons and was operational by 1998. The venture, estimated to cost US$110 million, was 60%-owned by NKK and 40%-owned by Vietnam Steel Corp. In 1996, NKK strengthened its alliance with Sahaviriya, Thailand's leading industrial conglomerate, by forming another joint venture. The new venture, Thai Cold Rolled Steel Sheet Public Co.,(TCR), boasts a new one million ton-per-year cold-rolling mill that has recently come on line

**Ownership Structure**

As of September 1997, nine Japanese corporations owned 27.5% of NKK's outstanding shares, including Dai-Ichi Life Insurance (4.7%), Fuji Bank (3.7%), Nippon Life Insurance (3.4%), and Yasuda Life Insurance (3.4%). There are no particular restrictions on foreign ownership, except that the 5% rule of Securities and Exchange Law requires that foreign ownership in excess of 5% be reported to the Ministry of Finance. Foreigners held about 5% of the outstanding shares, and approximately 26% of all shares are held by investors owning 50,000 shares or less.

<Table 2-6>NKK Corp. Selected Financial Data (¥ million), non-consolidated

| | '95 | '96 | '97 | '98 |
|---|---|---|---|---|
| Net Sales | 1,171,879 | 1,159,742 | 1,185,043 | 1,112,052 |
| Operating Income | 12,066 | 64,949 | 63,407 | 51,880 |
| Net Before Tax | (34,668) | 68,353 | 47,220 | 17,197 |
| Total Asset | 2,103,839 | 1,936,978 | 1,887,710 | 1,955,869 |

Source : Company Report

# Part III . Case Study of POSCO's Globalization

## 1. Company History

POSCO (Pohang Iron & Steel Corporation) was founded in 1968, and in fewer than 25 years, it emerged as the world's second-largest producer, behind Nippon Steel of Japan. POSCO is the only integrated steel producer in South Korea. The company operates two integrated steel facilities in South Korea; Pohang and Kwangyang Works. Pohang Works and Kwangyang Works have annual production capacities of 12.2 million tons and 15.8 million tons, respectively. The company produces hot- and cold-rolled steel, steel plates, wire rods, and stainless and silicon sheet and strip. Hot- and cold- rolled coils are the company's two most important product lines, collectively accounting for more than 60% of sales and shipments. POSCO sells about 70% of its production in Korea, in which it has a 53% market share. The remaining 30% is sold in the export market, primarily to Japan, China, and Southeast Asia.

In February 1997, POSCO agreed to purchase specialty steel businesses from the now-bankrupt *Sammi Steel Co*. for ₩719.4 billion ($837 million). Overall, its growth history can be divided into four phases. The first phase is foundation-laying period that lasted from 1968, when it was founded, to 1973, when it started its first operations. In this period, the company focused both on earlier construction of the "Pohang Facility I" as a coherent process of manufacturing, and on earlier operation, as a result. The construction cost per crude steel ton for this Pohang Facility I was $251, just 40 % of $667 for "CSC Facility I" of Thailand, which was built up in 1970s. This strong price competitiveness has

thereafter served as the main driving force behind POSCO capturing the global competitive edge in the shortest period of time. The company's painstaking effort paid off. In 1973, the year the company started its first operation, it earned ₩ 4.6 billion in operating profit. The very next year, in 1974, the company recorded ₩ 35.5 billion in net profit, advancing the management stabilization much earlier than planned.

The second phase, characterized as a period of quantum leap, covers from 1974 when the company started its major facility expansion, to 1985, when its 9.1 million per year production capacity started to be stabilized. In those days, the company went one step further in beefing up its competitiveness, by cutting down on energy, resources, outsourcing cost, and inventories, thus improving its labor efficiency. One thing noteworthy for this period is the fact that the company procured its facilities at the lowest possible cost, through open, competitive competition among world-class vendors.

The third phase was the period of full-scale growth, which lasted from 1984 when the company began to construct Kwangyang steel plant, to October 1992, when the construction was completed. In this period, POSCO concentrated its efforts on the completion of 21 million ton capacity production system, establishment of "one company two work plants system", business globalization and diversification. It was during this period also, that POSCO implemented the 2-phase internal capability-building project (1985-1987), aimed at achieving technology advancement, facility rationalization, high-quality products, and efficient management. This project led to POSCO realizing ₩ 378.4 billion in expected profit.

As a part of its globalization effort, POSCO in 1986, founded a joint venture company UPI (USS-POSCO Industries) with US Steel, and in 1988 founded a local branch company PIO in Osaka, Japan. Production cost saving and equipment efficiency maximization was also achieved, through "one company two plant works system." Under this system, Pohang focused on "a variety of products in small amount" around high quality products, while Kwangyang focused on "a few kinds of products in mass amount," around HR and CR coils. Especially, the automization of entire process from production to shipping in Kwangyang works -- the 21st century's state-of-the-art integrated steel plant-- has pushed it to the world's no. 1 place in terms of production efficiency.

The fourth phase was the period from 1993 to the present. POSCO has devoted its efforts both to maximizing customer satisfaction through not just price, but quality and technology competitiveness as well, and to laying the foundation to grow as a world-class global company. To this end, POSCO has been restructuring and reengineering all the management processes resolutely, in order to bring in a new management system, where each and every employee is encouraged to exert his creativeness and capabilities to its full extent. Particularly, POSCO has successfully combined the traditional blast-furnace-based production with new innovative technologies like shin slab casting, to secure the most environment-friendly and competitive steel-making processes. On production side, the company puts the highest priority in creating high-value added, by devising the most appropriate product mix.

## 2. Globalization

POSCO commenced to create its overseas branches back in early 1980. As of the end of 1998, POSCO has 48 businesses and 45 overseas branches. Out of 48 businesses, 15 are in operation, 6 under construction, 8 in the pipeline, and 19 on the boards.

<Table 3-1> Overseas Subsidiaries of POSCO

**Major Subsidiaries in Operation**

| Company Name | | Build-ing | Business (Thousand ton/Year) | Owner ship(%) | Major Share Holder |
|---|---|---|---|---|---|
| U | POSAM | '84 | Steel Trade | 100 | - |
| S | (UPI) | '86 | Cold-Rolled, 1,440 | (50) | USX 50 |
| A | (SCI) | '89 | Building Leasing | (100) | - |
| Viet | POSVINA | '92 | Galvanizing Flat ,50 | 50 | SSC 50 |
| nam | VPS | '94 | Wire Rod ,200 | 35 | POSTEEL 5, Daewoo 10,VSC,etc 50 |
| | VINAPIPE | '93 | Flat, 30 | 15 | VSC 50, Se-A 35 |
| C | Dalian POSCO | '95 | CGL ,100 | 40 | POSTEEL 15,Sun- |
| H | - CFM | | | | Jung 15,China 30 |
| I | POS-Tianjin | '94 | Coil Center, 100 | 10 | POSTEEL 60, |
| N | Coil Center | | | | Traders 40 |
| A | Guangznou Jindo | '93 | Container, 540 M | 10 | POA 2.5, Jindo 26 |
| | | | | | China 49, Japan 12.5 |
| | POSINVEST | '95 | Financing | 50 | Hanvit Bank 50 |

Source : Company Report

The main characteristics of overseas activities of POSCO are as follows. First, overseas subsidiaries now in operation were mostly built up, in the form of the typical primitive overseas investment by steel industry, and thus covers the down-stream processes such as

Coil-Center, galvanizing flat mill, wire mill, Rod and Steel Pipe mill.

**Subsidiaries in Construction**

| | Company Name | Location | Business Contents(Thu/Yr) | Owner ship | Major Share holdrs |
|---|---|---|---|---|---|
| C | Dalian POSCO-CFM | Dalian dev't zone | color coated sheet 50 | 40 | Posteel 15, China 30 |
| H | Zhanjingang POSCO | Zhangjingang | CGL 100 | 90 | Shagang Gr. 10 |
| I | Zhangjingang Pohang Stainless | Zhangjingang | STS CR 110 | 80 | Shagang Gr. 20 |
| N | Shunde Pohang Coated | Shunde | CGL 100 | 90 | China 10 |
| A | Shunde Xingpu Steel | Shunde | Coil Center 120 | 10 | Samsung 39 |
| | Myanmar-POSCO | Yangon | CGL 30 | 80 | UMEHL 20 |
| | SUS | Pakorn, Tailand | Cold-Rolled 910 | 3 | Tailand 60 |
| East | POS-Thai | Pakorn,Tailand | Coil Center 120 | 18.5 | Posteel 19.5 |
| Asia | KS-POSCO | Indonesia | Hot-Rolled 1,000 | 40 | PTKS 40 |
| | POSNESIA | Indonesia | STS CR 75 | 70 | METRO 30 |
| | POS-Hyundai | India | Coil Center 100 | 10 | Hyundai 70.5 |
| South | POSVEN | Venezuela | HBI 1,500 | 40 | Posteel 10 |
| Am'a | KOBRASCO | Brazil | PELLET 4,000 | 50 | CVRD 50 |

<Table 3-2> Overseas Subsidiaries of POSEC

**Subsidiaries in Operation** (unit : U$ thousand)

| Corporation | Location | Business | Cap.(th/yr) | Build | Capital Invest | Share(%) |
|---|---|---|---|---|---|---|
| POSLILAMA | Vietnam | Structural | 15 10,' | 96 | 17,119 | 60 |
| POSEC EUROPE | U.K | Engineering | - 2,' | 95 | 5,000 | 100 |
| (DAVY DISTINGTON) | U.K | Engineering | - 4,' | 95 | (5,455) | 55 |
| SUM | | | | | 22,119 | |

Note: DAVY DISTINGTON is a subsidiary of POSEC EUROPE, so the amount of capital investment was not accounted in the total capital investment.

**Subsidiaries in Construction** (unit : U$ thousand)

| Corporation | Location | Business | Capital Invest | Total Equity | Ownership(%) |
|---|---|---|---|---|---|
| POS-PLAZA | China | office building | 186,450 | 62,373 | 100 |
| Zhangjingang Pier | China | pier | 12,500 | 5,000 | 90 |
| DIAMOND-PLAZA | Vietnam | office building | 91,942 | 23,354 | 60 |
| POSEC-HAWAII | USA | senior house | 73,900 | 9,500 | 100 |
| Other Affiliates(2) | Russia, etc | office building | 635,190 | 150,000 | 10-12 |
| Sum | | | 999,982 | 250,277 | |

In this type of foreign investment focusing on down-stream, POSCO exports hot- and cold-rolled coils, and process/sell them to local markets' taste. This foreign direct investment (FDI) served two different purposes: 1) it provided POSCO with a strong and solid foothold for export, and 2) it served as a POSCO's strategic demand creation/production basis, through which POSCO can explore local steel market.

Second, looking at the foreign investment that is either under construction or in conceptual stage, one thing is quite noteworthy: Although the big chunks of them still focus on the same down-stream process, some belong to upper stream. They are a 1-million ton capacity mini mill and a flat mill with capacity of 75 thousand tons in Indonesia, and a mini-mill in Vietnam. FDI in down-stream process, where the factories usually start to operate with less than 100 thousand ton capacity to be later on gradually expanded, requires a small amount of initial investment, therefore relatively little risk is involved. In contrast, FDI in upper-stream process, where factories start out with bigger capacity, requires higher investment cost and thus involves higher risk.

Thirdly, among the POSCO's FDI, some FDI are made not to produce steels, but to

support the steel-production. Examples are an overseas branch of POSTEEL, a sales/marketing subsidiary of POSCO, and overseas branch of POSEC, a construction/engineering-supporting subsidiary, and an overseas branch to support financial areas.

Fourthly, some FDI were done for the main purpose of either securing iron ore and raw material coals, or producing intermediary goods. Fifthly, POSCO's overseas activities are mostly done in the form of joint venture, instead of POSCO covering 100% of the required investment cost. POSCO's joint venture-partners are various: domestic Korean conglomerates and foreign advanced steel makers, let alone local steel and steel-related company, POSTEEL/POSEC (two subsidiaries of POSCO). These partners and POSCO have jointly raised funding and put out the investment money. One benefit of these joint ventures was both financial burden and risk being reduced, with the possibility of tie-up with the joint venture partners being increased.

**<Case Analysis : POSVINA in Vietnam>**

Vietnam, as the export outpost of POSCO, was the first South East Asian country for POSCO to go into. POSCO began joint ventures with Vietnam, even before the Korean government open official ties with the Vietnam government, since Vietnam is a potentially important market in that it is located at the heart of the 100 million people of *Indo-china peninsula* spanning Vietnam, Raos and Cambodia. The steel demand from Vietnam was tiny at 15 Kg per person in 1996. However, if this expands little bit to reach the point of 100 Kg per person, Vietnam will become a highly prospective market with annual demand

of 7.5 million ton. POSCO's strategy with Vietnam is to make a pre-emptive investment to preoccupy this market.

POSVINA, POSCO' joint venture company in Vietnam that was established in 1992, has been growing successfully, after making profit at its founding year and 7 straight years of black ink. POSVINA was founded jointly with SSC, a Vietnamese steel company, on joint investment of 3.9 million dollars (POSCO invested 1.95 million dollars in cash, with SSC taking care of the remaining portion in kind). Currently, this company is being run without any borrowings from outside put in. POSVINA, with an annual capacity of 50,000 ton, is predominantly producing galvanized plates as a material for household roofs. It produced 40,000 tons in 1996, which was translated into 30 million dollars in sales.

The secret of the success of POSVINA is two-fold: selection of the products with higher marketability and high quality products. A big jump in the Vietnamese people income level led to a growing demand for the galvanized plate, a product produced by POSVINA. And the local Vietnamese construction companies preferred POSVINA's products, which are relatively high in price but excellent in quality. One competitive advantage of POSVINA was the fact that it enjoyed a stable provision of raw material from POSCO. In 1995, when its competitors suffered from a steep rise in steel price, POSVINA was able to get raw materials at a relatively lower cost, which led to 4.71 million dollars in black ink. But from 1996, the number of the competitors started to grow, causing a glut in supply, which in turn led POSVINA to a plummeting profit. With the competitors from Japan and other countries rushing into this market, competition is ever increasing.

### 3. Performance Analysis of Globalization

The recent business performance of overseas branches of POSCO and its subsidiary POSEC vary from one country to another. In the U.S., POSAM and UPI have recorded profit for the last 3 years. In Vietnam, however, only POSVINA is making money, with VPS and VINAPIPE remaining in red ink. In China, most of the overseas branches are losing money. Based on this, it may be said that other than investment into the U.S., POSCO's globalization efforts have not been a success. Still, it seems unfair and unjust to only look at their recent few years' performance, to evaluate overseas branches' business performance.

It took quite long years before POSAM and UPI in the U.S. started to make profit. Usually, it takes lots of time and effort for a particular business to start to move into a black ink beyond a mere break even point. In case of those POSAM and UPI, the initial investment was put in mid 80's, which was followed by a long period of painful suffering before the current black ink.

The investment into China and Vietnam which started in 90's is in its earlier stage, where there are problems of lack of economy of scales, limitations with operation technology and productivity. Performance of these investments will be all determined by the speed with which the challenges of increased demand and productivity are met.

In other words, the key to success of these investments is not the immediate few years' gain or loss but how POSCO will create/secure demand for these businesses, achieve

economy of scale, increase productivity through improved operation technology and stable labor/management relationship, and ultimately turn to black ink. These corporate activities to shorten the time taken to reach BEP are at the very heart of the POSCO's global management.

Any company that wants globalization needs core capabilities. To evaluate what are the key capabilities that have driven POSCO's globalization, firstly it is the capability to choose right investment locations and product items. This, in other words, is to make right decisions on what to produce and where to sell, which requires a clear understanding of situation in target markets and sharp insight into the company's own cost and quality competitiveness.

Positive sides with the POSCO globalization include 1) its ownership structure that is as efficient as that of a private company despite POSCO being a public entity and 2) POSCO'S globalization strategy was developed based on the past experiences of Japanese blast furnace companies. In short, POSCO's globalization was successful, in terms of the selection of where and what to produce (East Asia including China and down-stream processes).

In terms of the profitability, there are not a few overseas branches that are losing money. This, however, is deemed to be an inevitable phenomenon in earlier stage of the foreign investment. And only if the market conditions get stabilized, this undesired phenomena is likely to be turned around over time. The key issue in terms of profitability is how much the time taken to reach BEP can be shortened, which depends primarily on overseas

branches' efforts at market exploration, improved operation technology aimed at productivity increase, and stabilized labor/management relationship. The East Asian market including China seems, on condition of their national economies' long-term, steady growth, to emerge as the heart of the global steel industry.

Secondly, POSCO's technological capability, POSTEEL's trade/marketing capability, POSEC's construction/engineering capability came together to lead to a successful implementation of POSCO globalization. Out of these capabilities, what is most important is POSCO's technological capability, which is deemed to be the world's best. However creative a company was in selecting the investment location and items, this investment will be difficult to generate any economic effect, without the needed technological capability there. Some studies found that especially, in the steel industry, the key element of the competitiveness is operation technology.

Here, one concern is the labor/management relationship in POSCO's overseas branches. POSCO has traditionally kept a very strict and stern corporate culture. This strong, deep-rooted tradition has survived even the inflow of the U.S-style corporate culture, ultimately to be recognized as a valuable asset of POSCO.

This POSCO-style labor-management relationship can not work in overseas branches, however. Therefore, as POSCO's globalization progresses further, a labor-management relationship model that fits into the particular local situation/culture shall be developed, too. Without this done successfully, operation technology it alone can not increase the productivity.

Thirdly, POSCO has enjoyed a strong capability to raise fund to support global financial management. POSCO is deemed to possess a substantial fund-raising capability both in direct and indirect financial markets, based on its high credit ratio, which was backed up by its physical competitiveness and healthy financial structure. And POSCO itself has considerable amount of investment capability coming from its huge net profit, which can give financial support to POSCO's globalization, while overcoming the market entry barrier of need for large amount of money.

<Table3-3> **Performance of POSCO's Selected Overseas Subsidiaries** (U$ thousand)

| Company Name | | Opera-tion | 1995 | | 1996 | | 1997 | |
|---|---|---|---|---|---|---|---|---|
| | | | Sales | Profit | Sales | Profit | Sales | Profit |
| USA | POSAM | 1984 | 212,814 | 1,348 | 272,977 | 4,106 | 310,454 | 6,354 |
| | (UPI) | 1986 | (771,446) | (12,715) | (815,373) | (9,085) | (882,551) | (30,060) |
| | (SCI) | 1989 | (13,192) | (1,883) | (1,515) | (1) | (1,134) | (230) |
| Vietnam | POSVINA | 1992 | 35,421 | 5,907 | 30,085 | 1,037 | 20,501 | 395 |
| | VPS | 1995 | 4,348 | -385 | 26,722 | -4,384 | 45,798 | -3,347 |
| | VINAPIPE | 1994 | 8,540 | -753 | 11,318 | -285 | 13,655 | -508 |
| China | Dalian POSCO | 1995 | - | - | - | - | 8,090 | -1,090 |
| | POS-Tianjin | 1994 | 166 | -80 | 14,872 | -123 | 26,816 | 11 |
| | Guangznou Jindo | 1993 | 98,142 | 3,521 | 80,900 | -4,925 | 106,829 | -2,321 |
| | POSINVEST | 1995 | - | - | - | - | 37,000 | -295 |

Note : Profit is the figure of before tax, Source : Company Report

POSCO, even in its early days of foundation in 1968, has successfully implemented the "integrated steel-producing process," which seemed something impossible to the eyes of the overseas steel industry. What is underlying POSCO's corporate culture is the "Yes, you can" and "can-do" spirits. Although, as mentioned earlier, POSCO's ownership structure has some problems typical of all the other public entities, still it has a stronger

adventurism and willingness to take risk, compared to foreign companies.

The fourth factor is that POSCO is judged to possess a strong capability to get those information that are critical for global management. The sources from which POSCO collects these information are various: From POSTEEL comes the information on business trade. From POSRI comes the information it has collected during its R&D activities. Another source of information is advanced foreign steel companies with which POSCO has tie-ups. For the past 30 years, POSCO has accumulated the capability to collect and analyze information not just on steel industry but on other kinds of information needed for performing business activities overseas. This ability to get/analyze information combines with its another ability to choose right investment location and product items, to create a synergy effect.

The fifth factor is the core capability of POSCO's joint venture partners, considering the fact that POSCO's globalization is performed mostly in the form of joint venture, rather than independently. For POSCO to make best of its partners' core capability, it is very important for POSCO to select right partners and to properly split up the roles/responsibilities between POSCO and its partners. There is a mixed evaluation on whether POSCO has so far chosen right partners in light of their core capabilities. As for the joint ventures in China, Vietnam, Indonesia, and Brazil, the key partners are the local steel companies. Their strengths lie in the fact that they are very familiar with the local situations and can facilitate the communication with the local government. Their weakness, however, lies with their poor technological capability.

More fundamental problem with the POSCO's globalization efforts is like this. First, there is no clear definition of what POSCO's globalization is for. Out of the possible objectives like profitability, stability, technological advancement, management efficiency increase, smoother corporate financial activities, exactly what is the objectives of the POSCO's globalization? And, in potential areas of globalization like production, raw material coal procurement, marketing/sales, R&D/product development, corporate ownership structure, business portfolio, exactly where does POSCO wants to do globalization? There are criticisms that POSCO lacks a clear and solid vision/blueprint of its global management, and if any, it is being shaken due to the instability with the corporate control. Looking at POSCO's global management so far, it seems that POSCO's globalization has three key objectives of 1) expansion of global market 2) based on this expanded global market, accomplishing the economy of scale in domestic steel production, and 3) stable provision of raw material and substitutes.

Secondly, globalization needs people, organization and software to be there for its implementation. It is questionable if POSCO possess the right people, organization and software. This problem may be interpreted as one aspect of POSCO traceable back to its ownership structure. In 1996, POSCO, in an effort to respond to fast-changing business environment, put together the organizational units related with overseas businesses that were scattered around, to launch the "Overseas Business Headquarter." The basic idea, here, was to put together talented staffs in various areas like finance, technology, procurement, etc, in order to establish a system where as soon as the feasibility of a overseas business is verified, these staffs' accumulated capabilities in various areas can be readily combined together.

Launching of this Headquarter itself is judged a step forward toward the globalization. The functions this headquarter has performed, however, was quite nominal, not substantial enough to combine together the corporate capabilities for a more rational decision-making.

Thirdly, based on the fact that global management is one of the corporate activities that require huge amount of resources, all the resources put into POSCO globalization should be looked at in terms of opportunity cost. Here, the key is how POSCO can strike the right balance between expansion of domestic businesses and overseas investment.

Assuming the domestic demand for steel getting sluggish in the future, making right choice between business diversification in the domestic market and getting more proactive in the overseas steel market is hugely imperative. As POSCO's past experience with domestic business diversification into mobile telephone, and IT businesses tells, diversification does not necessarily guarantee a high profit. This is true also of the overseas investment.

AS for the overseas investment, the plan to invest in a mini-mill in Indonesia was cancelled out due to skepticism about its economics involved. Then, here comes the most important decisions to be made: 1) What is going to be the total amount of the investment to be put in? and 2) How can the investment resources be best split between domestic business expansion and overseas investment? Here the key seems to be the kind of corporate ownership structure that allows a rational decision-making and software that can guarantee a decision made in a scientific way.

The harsh reality with POSCO is that we can not easily say that POSCO possess these two keys above mentioned. One lesson to be learned from the experience with the world's best companies is that if the decision on resource allocation is made only on CEO's intuition, the investment is highly likely to become a failure.

# IV. Conclusion

Japanese steel-makers were the early participants in the globalization trend during the 1980s, as they took direct quickly stakes in U.S. steel companies such as *Armco and National Steel* and formed joint ventures with *Inland Steel, LTV, U.S Steel*, and *Wheeling Pittsburgh Steel*. These moves were made by the Japanese to support domestic automotive customers with newly established transplants in the U.S market. Another motivating factor for the Japanese move into the United States was to reduce their risk of being shut out of the U.S market by trade sanctions. Facilitating the Japanese move into the United States was the extremely low-cost financing made available by the Japanese financial institutions. Today, extremely tight credit availability coupled with highly leveraged balance sheets and a poor earnings outlook severely limit the capability of Japanese steel companies to make additional consolidation moves in the world.

Ispat's high insider ownership along with a visionary management team have provided it with the ability to take calculated risks in privatizations worldwide, making it the truly global steel producer, with operations in six different countries. Ispat's growth strategy has been focused on the acquisition, at low costs, of under-performing integrated Mini-Mills formerly owned (and mismanaged) by governments. The company now has gone away from privatizations, given the limited opportunities, and has focused on the acquisition of privately owned steel assets. Most recently, Ispat acquired Thyssen's Long Products division in Germany and entered the U.S. steel market through the acquisition of Inland Company.

British Steel has also been active – branching out in Europe and United States. Currently, British Steel is a participant in a joint venture with LTV and Sumitomo in Trico, a Mini-mill in the United States. British Steel has also achieved full-scale globalization interests via its ownership of Tuscaloosa Steel in the United States, and through a 51% ownership stake in stainless steel producer Avesta Sheffield in Sweden. British Steel has stated that it is pursuing further globalization opportunities for growth in both steel production and distribution.

There are several issues to be overcome in relation to POSCO's intended globalization.

**Increased competitiveness and expansion of existing overseas activity**

POSCO's focus needs to change from one principally concerned with domestic demand to one of export. Recognition is required by POSCO to further develop its export strategies and activities. Accordingly, POSCO should redirect its efforts by securing a stable base of long term customers within the global steel market in order to maximize its profit. This contrasts with current management strategies of satisfying domestic demand at low prices with exports being met from residual supply.

Also, with current overseas joint ventures, POSOC needs to shorten the time required to surpass the break-even-profit point. The performance of POSCO's foreign direct investment can be improved by:

- securing increased foreign demand for its products
- ensuring production capacity to achieve these higher levels of demand
- increased labor productivity through improved labor force skills and effective industrial relations policy

Current foreign direct investment is of a small capacity, usually less than 100,000 tons of output per year. In this regard, improvements through economies of scale are achievable.

## Globalization and the importance of the governance structure

A company's governance structure has an important influence on policies relating to globalization. This includes:

- Location of production facilities
- The types of products to produce
- The balance between exports and foreign direct investment
- The choice between domestic operations and foreign direct investment
- Globalization strategies

Effective policies can only be achieved within POSCO with creative and innovative management taking these factors into account. Another issue affecting this is POSCO's changing ownership structure over time. Since it's foundation in 1968, ownership structure has changed many times through the sale of government shares, the introduction of domestic market ownership, employee stock sharing plans, and foreign shareholdings. As a result, the government's and the KDB's share of ownership has been dramatically reduced. Foreign ownership is now 38.34% (December 1998). However, this level of foreign ownership does not ensure a policy aligned with globalization strategies.

However, in the future, the majority distribution of ownership will be an important factor affecting management policy regardless of whether these be domestic or foreign shareholders.

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