The Outlook for Steel Development

—The Case of Latin America—*

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I. Introduction

The world outlook regarding the steel industry has, of late, become very foggy, very confused. In this respect, It was of extreme significance that last year—in October, 1978, in its annual meeting held at Colorado Springs—The International Iron and Steel Institute could not agree on a worldwide forecast for the industry. A forecast that customarily had been made every previous year. The prognosis for the industry was so contradictory that the experts had no common ground from which to evaluate the future. Let's hope that this year, at this very moment, when they are meeting in Sidney, they could agree on a clear forecast for the year ahead.

Nevertheless, in spite of this worldwide situation, certain regions of the world appear with more definite contours; regarding the future of their steel industry. This does not imply, that the development of their industry, is by any means, devoid of very serious problems, nor that all the plans are being fulfilled in their entirety. But the industry has, in sharp contrast, with other regions of the world, a very positive, I could even say, optimistic, approach, which translates itself in the foreseeable future, into a vigorous development of the industry. We have already presented this thesis in a different form at other international gatherings. Notably, we have presented it in Chicago—at The Third International Iron And Steel Congress in April 1979, and later at The UNIDO Second Consultation Meeting in New Delhi in January of this year.

In Chicago we presented the thesis of how, by utilizing their growing markets and their raw material resources the developing countries could undertake a very vigorous plan for developing their steel industry and reaching the goal established in the so-called Lima Target.¹⁾ This target establishes that The Third World Nations should share with a 30% in the world steel production by the year 2 000; *i.e.*, roughly, with a production between 500 and 550 million tons; estimating that world production would be around 1.5 billion tons by that year.

In Delhi we presented what was the particular Latin American contribution to the achievement of that goal. It was discussed there, and rightly so, the difficulty of assessing progress with regard to such a distant goal.²⁾ The year 2 000 is for planning purposes too far away. This means that intermediate and shorter goals, should be set, not only because they

could be more easily reached, but because they could be set under a more realistic and measurable program, and so it could be determined whether the Lima Target could or could not be reached and so decide what needed implementation either to reach or, otherwise, to modify it.

II. Outlook of Iron and Steel Industry in Latin America

Today, I would present in accordance with what has been previously said and with the spirit and purpose of The Yukawa Memorial Colloquy an outlook of the Latin American iron and steel industry today and in the near future, its achievements, its present state and its development plans. In this way we hope to show what is being done in this region of the world towards achieving the Lima Target as well as contribute to the discussion of the problem of international assistance for technical progress of the iron and steel industry between Japan and our region. I hope that these goals can be materialized.

Latin America consists of 10 countries in South America, 6 in Central America, Mexico in North America and several island states (Cuba, Dominican Republic, *etc.*). The total area covered by the 17 continental countries is approximately 20 million km², with a population of slightly over 300 million people (see the Figure in p. 70). Spanish is the official language in 16 of these countries and Portuguese in Brazil. Both are very similar.

All countries belonging to this geographic area are considered developing countries but there are considerable economic differences in geographic extension and population. Argentina, Brazil, Mexico and Venezuela together occupy 72% of the territory and their total population make up 70% of the population of the region. Incomes per capita differ greatly from one country to another and also within each country, which is a well-known feature of developing areas. Up to the 40's the development on the region had been based solely on the production and export of raw materials and food products and the income generated by this trade made it possible to import capital goods, including iron and steel products. These imports were nevertheless seriously affected by the world economic crisis in 1930 and steel production began from a need to encourage a deliberate industrialization process.

The end of World War II concurred with a period

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of intense activity in this sector. Steel production started at Altos Hornos de Mexico in 1944, at Altos Hornos Zapla, Argentina, in 1945 and at Companhia Siderurgica Nacional, Brazil, in 1946. Compania de Acero del Pacifico, Chile began its activities in 1950; Acerías Paz del Río, Colombia, in 1955; and The Chimbote, Peru and Hojalata y Lámina, Mexico, in 1958. Somisa, in Argentina began three years later and during the following couple of years, SIDOR in Venezuela and USIMINAS and COSIPA in Brazil. This rapid development of integrated plants in influenced also the establishment of other semi-integrated and rolling plants, a fact evidenced by an increase in steel production, from 4.7 million tons in 1960, to an estimated 30 million tons at the beginning of the 80's.

Though quite widespread, 94% of iron and steel production is concentrated in Argentina, Brazil, Mexico and Venezuela, there are 18 integrated plants in Latin America, which account for 80% of the total steel production. The largest plants of this type are almost entirely state owned. Over 60 semi-integrated plants produce 20% of the total steel output; they are concentrated mainly in Argentina, Brazil and Mexico and most of them are private companies. Steelmaking as well as ironmaking procedures show a special technological profile in our region. Thus, the main steel producing facilities are oxygen converters, accounting for 40% of steel production and electric furnaces, for 31%. Primary iron production comes 62% from coke based blast furnaces, 22% from charcoal based blast furnaces, 13% from direct reduction processes and 3% from electric reduction furnaces. We believe that the importance of direct reduction and electric furnaces processes will increase; in Venezuela, my country, for instance, we have started operations on Plan IV in SIDOR, which

Table 1. Latin America: Steel production and apparent consumption (in 1 000 t of ingots).

	Production		Estimation of apparent consumption	
	1977	1978	1977	1978
Argentina	2 682	2 818	3 780	2 430
Brazil	11 164	12 106	12 300	13 320
Colombia	330	391	700	750
Central America	62	64	725	770
Chile	548	597	513	580
Ecuador	—	—	290	302
Mexico	5 601	6 741	6 150	7 000
Peru	379	377	600	482
Uruguay	19	9	110	118
Venezuela	854	860	3 670	3 771
Others	—	—	120	130
Total	21 639	23 965	28 958	29 653

Source: ILAFA

Table 2. Latin America: Steel demand and production capacity (in 1 000 t of ingots).

	Demand		Capacity	
	1980	1985	1980	1985
Argentina	4 300	8 600	4 150	8 070
Brazil	15 000	24 000	14 661	28 276
Colombia	930	1 300	560	1 500
Central America	830	1 160	90	150
Chile	680	1 050	1 000	1 500
Ecuador	333	490	—	300
Mexico	8 032	12 131	11 430	14 000
Peru	819	1 461	600	1 000
Uruguay	140	180	30	130
Venezuela	4 950	7 435	2 500	7 710
Others	150	210	—	200
Total	36 364	58 017	34 931	62 836

Source: Estimates made by ILAFA.

will raise this company's production to 5 million tons of steel per year, incorporating direct reduction and electric steelmaking processes to an unprecedented degree.

The figures in Table 1 show that Latin America produced: Last year slightly under 24 million tons of steel—11% more than in 1977—thus confirming the sustained development of the region in this sector and also the fact that in spite of having been affected by the critical situation of world economy, it was hit to a lesser degree than the iron and steel industry of industrialized countries. In 1978, steel consumption amounted to slightly over 29.5 million ton and production, a little under 24 million; that is, 80% of consumption was accounted for by regional production.

III. Projections for the 80's

The most recent projections (Table 2) indicate that Latin America will consume slightly over 36 million

tons of steel (expressed in ingots) in 1980, a figure that will be very close to reality considering such a short term and the adjustments made in recent months, which have meant a considerable narrowing of the targets foreseen a year ago. On the other hand, projects underway will raise production capacity in that year to nearly 36 million tons. Considering, however, that these facilities will start operating during the later part of 1980 and that the older equipment will not be fully utilized, production will only reach some 30 million tons, thus maintaining the present deficit in relation to demand in the region.

During the mid 80's, demand will move up to around 58 million tons and expansion plans indicate that there will be capacity to produce over 60 million tons. Thus for the same reasons already mentioned, the dependence from imported steel will continue (and will, perhaps, even grow).

IV. Long Term Prospects: Year 2000

Considering the present situation of world economy and the changes in the geography of steel production, it is daring to make forecasts exceeding a three year period. Nevertheless, we have prepared Table 3, presenting three alternatives of demand growth from 1979 to 2000:

- 1) The minimum growth rate, of 6% per year
- 2) The most likely, with a mean annual growth of 7.5% during that period and which corresponds to that of the last 15 years, from 1963 to 1978

Table 3. Year 2000: Consumption and production alternatives (1 000 000 t).

Alternatives	Consumption	Production capacity
Minimum 6%	106.9	118.7
Most likely 7.5%	145.6	161.7
Maximum 9.5%	218.4	242.6

Source: Author's estimates

- 3) The maximum, with a mean annual growth of 9.5%

In spite of the fact that some countries in the region have considered generating a certain net steel surplus for export, we are absolutely conscious of the financial limitations of Latin America; thus, in order to estimate its production capacity by the end of this century we will suppose only that the region as a whole will be self sufficient regarding production, that is, that exports will only compensate the volumes that it will be necessary to import from outside the area. In all cases, a high and fixed capacity utilization of 90% is assumed. Once these cautious figures have been included in Table 3, it can be appreciated that capacity could vary from approximately 120 million tons to slightly more than double that figure, estimating that the most likely alternative will be somewhat over 160 million tons of steel. Such growth requires iron and steel plant investments (strictly speaking, without considering infrastructure) of about US\$6 billion per year, whereas in 1977, Latin America invested only \$2.6 billion in iron and steel industry equipment.

V. Favourable Conditions and Obstacles for Steel Development in Latin America

Table 4 shows that the region concentrates 28% of world iron ore (percentage of recuperable iron). Its reserves being the largest in the world, comparable only to those in the USSR. Latin American iron ore mining is one of the most advanced in the world. Its production amounted to nearly 113 million tons in 1977, of which, over 84 million were exported. This figure represents around a third of the iron ore overseas trade.

From a technical point of view, the dependence from hard coking coals is critical because, as can be seen from Table 5, Latin America has only 0.2% of the total world reserves of this energy carrier. Fortunately, there are prospects of increasing coal re-

Table 4. World iron ore resources (1 000 000 t).

	Reserves*	Pot. minerals**	Resources	Recuperable FE	Percentage
World	278 053	556 779	834 832	99 305	100.0
Developing regions	78 391	144 079	222 470	40 490	40.8
Latin America	56 691	67 179	123 870	27 600	27.8
Asia, Middle East	17 300	54 200	71 500	10 124	10.2
Africa	4 400	22 700	27 100	2 766	2.8
Industrial Regions	89 162	218 899	308 061	30 693	30.9
Australia, New Zealand, New Caledonia	18 500	17 000	35 500	10 200	10.3
Canada	36 300	89 400	125 700	10 641	10.7
Europe	21 300	12 800	34 100	7 738	7.8
USA	10 662	97 899	108 561	1 814	1.8
South Africa	2 400	1 800	4 200	300	0.3
USSR	110 500	193 801	304 301	28 122	28.3

Source: "Valorization of Natural Resources and the Growth of the Iron and Steel Industry" in D.C.A. Gamboa, (III International Iron and Steel Congress, Chicago, April, 1978).

* Mineral reserves which may be developed under economic and local conditions existing at present.

** Potential minerals, minerals requiring technological, economic and local conditions that are more favourable for exploitation than the ones existing at present.

Table 5. World coal resources—All ranks and hard coal (1 000 000 t).

	Reserves total	Hard coals*	Percentage of total	Pot. minerals	Resources	Percentage of world total
World	1 321 698	476 270	100.0	10 379 820	10 856 090	100.0
Developing regions	243 210	116 370	24.4	1 071 951	1 188 321	10.0
Latin America	9 078	742	0.2	25 355	26 097	0.2
Asia, Middle East	230 958	113 877	23.9	996 318	1 119 195	10.2
(of which China)	(200 500)	(101 300)	21.3	(910 400)	(1 011 700)	(9.3)
Africa	26 607	1 751	0.4	50 278	52 029	0.5
Industrial regions	687 399	189 671	39.8	3 618 337	3 808 008	35.1
Australia, New Zealand	74 694	13 805	2.9	185 836	199 641	1.8
Canada	9 034	4 195	0.9	104 582	108 777	1.0
Japan	8 628	791	0.2	7 837	8 628	0.1
West Europe	207 257	36 853	7.7	455 267	492 120	4.5
USA	363 662	123 443	25.9	2 831 060	2 954 503	27.2
South Africa	24 224	10 584	2.2	33 755	44 339	0.4
USSR and East Europe	366 865	170 229	35.8	5 689 532	5 859 761	54.0

Source: "Valorization of Natural Resources and the Growth of the Iron and Steel Industry" in D.C.A. Gamboa, (III International Iron and Steel Congress, Chicago, April, 1978).

* Hard coal including anthracite and bituminous coal.

serves in this area, in which prospecting has been insufficient. There are promising areas in very little explored regions such as Amazonas, Acre, Rondonia and Parana in Brazil; Amazonas and Caquete in Colombia; Beni and Santa Cruz in Bolivia; Madre de Dios in Peru and Perija in Venezuela. Nevertheless, the most immediate prospects of obtaining a regional supply of this reducing agent are in the excellent Colombian and Venezuelan deposits.

A favourable condition for the Latin American iron and steel industry development and which is often not sufficiently appreciated is the amplitude of the regional market and its attractive future prospects. Figures in Table 1 show that the average regional steel deficit in the last two years amounted to slightly less than 6.5 million tons and that this situation will continue, in the least of cases, until at least the middle of the next decade. This steady regional demand is a basic element to enable the creation of new plants and the expansion of the existing ones in the area. Another positive aspect is the fact that the Latin American iron and steel industry is mostly state owned, as mentioned in the introduction. When the state participates in the steel business, it does so, not only considering its profitability, but also for other reasons related to the social cost of that production. On the other hand, the fact that state and privately owned companies coexist in these countries is a guarantee for consumers since it allows a certain regulation of commercialization conditions.

Among the obstacles to the development of the iron and steel industry, mention must be made of financing, the difficulties to find technical personnel and certain restrictive measures in international steel trade. The above figures on investments in Latin

America evidence the magnitude of the financial problem. But it is not only its dimension that makes it the most important obstacle, but certain special characteristics of the steel sector. For the sake of simplification, I will refer to only two of the most important conditions. Firstly, the long maturity times required by these investments are longer in developing countries due to circumstances inherent to their condition and secondly, the fact that profitability is always low in this sector and this hinders both the generation of their own resources and the repayment of the debts incurred. With this brief sketch I hope to have given a short, but precise picture of the great possibilities for development of the Latin American steel industry. We feel confident that this challenge will be met. Our countries are growing and developing at an increasingly rapid pace. They will need, no doubt a larger contribution of outside help.

There are here ample opportunities for a greater cooperation with Japan, and Japanese industries. There are already several cases of Japanese participation in joint ventures with excellent results. We are confident that the future will see more participation of Japan and Japanese industries with capital, equipment, know-how and people.

REFERENCES

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