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# Problems of Heavy Industry — Brazil

by Dr H. J. Otto, Kiel

Latin America's natural riches in suitable raw materials and some isolated successful attempts at producing iron and steel encouraged early plans to create heavy industries in the countries of the sub-continent. It was realised right from the start how important it would be for these countries to have heavy industries of their own. But the decisive impulse to develop these sectors in Brazil, Argentina, Mexico, Chile and Colombia emanated from the renewed import difficulties these countries experienced during World War II. All these new iron and steel enterprises were financed either entirely out of public funds or the authorities had at least a controlling interest in them.

## **Pace-maker in Latin America**

The pace-maker along this road was Brazil, being the country with the largest and most valuable iron-ore deposits (35 to 50 billion tons, of which 2 to 4 billion tons with an Fe-content of more than 55 per cent). It was in 1940 that the Companhia Siderúrgica Nacional (CSN) was founded with public funds, and this concern built with North-American help in Volta Redonda (in the Federal State of Rio de Janeiro) the largest heavy industrial plant of Latin America. The company started to produce pig-iron, crude steel, rolling-mill products and coking-plant by-products in 1946. The initial crude-steel capacity was assessed at 730,000 tons, the raw material coming from deposits owned by the works. The distance from the production plant to the ore deposits is roughly 250 miles and the coal deposits are about 480 miles away, but rail and road connexion are good. On the other hand, the quality of the local coal is such that it must be mixed with double the quantity of North American coking coal.

The locations of some of the new plants in the other countries were considerably more favourable: The Huachipato Works in Chile for instance is situated in the immediate vicinity of valuable ore and coal deposits and also of the efficient port of Concepción; In Argentina, the plant at San Nicolás on the river Plate is well served with transport facilities by rail, internal waterways and ocean-going ships, but it is far from any iron and coal deposits; in Mexico, the centre of heavy industry at Monterrey is between 60 and 240 miles south of its iron and coal deposits, but disposes of good road and rail connexions; in Colombia, the steel works at Paz del Rio is located in the high mountains in the im-

mediate vicinity of ore, coal and lime-stone deposits and disposes of good rail and road facilities. The output potential of all these works is smaller than that of the Brazilian enterprise, but enlargements have either already taken place or are planned for the future.

These first new foundations encouraged the creation of further iron and steel works in Latin America with Brazil taking the lead; the already existing larger enterprises such as the "Mineração Geral do Brasil" and the "Companhia Siderúrgica Belgo-Mineira" extended and modernised their plants. Apart from several smaller undertakings, a number of large enterprises were founded with or without state participation with the result that Brazil's output of pig iron and crude steel has since multiplied. Two newly founded enterprises deserve special mention inasmuch as they were financed by foreign capital and have become rather important; they are the "Companhia Siderúrgica Mannesmann", which was founded in 1952 in Belo Horizonte (Minas Gerais) as a subsidiary of the German firm of Mannesmann, and the "Usinas Siderúrgicas de Minas Gerais" (Usiminas) in Ipatinga (Minas Gerais), which has been in existence since 1956 with Japanese participation. Both works are sited in the midst of Brazil's largest and most valuable ore deposits.

True, the fact that Brazil's iron and steel output has multiplied is by itself not yet sufficient to satisfy the demand which as the result of progressive industrialisation has enormously increased (since 1958 Brazil has been building motorcars, tractors and ships). On the other hand, thanks to the much larger output Brazil has now moved into first place among the steel-producing countries of Latin America. In 1966 Brazil produced 3.7 mn tons of steel, Mexico 2.65 mn, Argentina 1.25 mn, Chile 540,000, Colombia 216,000 and Venezuela—a new-comer—537,000 tons. Within twenty years steel consumption per head of population has more than trebled in Brazil, rising from just under 28 pounds in 1945 to nearly 100 pounds in 1965, and this despite the fact that the country's population has shown an increase which is much above average.

## **Building up a Heavy Industry**

The massive development of a heavy industry in Brazil got under way only as a result of the economic difficulties experienced after 1955. Once the

Korea-boom of raw material prices, including the world market price for coffee, had come to an end, Brazil was more than ever obliged to curtail in the interests of equalising its balance of payments all non-essential imports. This became all the more necessary as the progressing industrialisation led to increasing imports of capital goods. Encouragement was therefore given to all products of the heavy industry if only they helped to save foreign currency for imports. Imports were restricted to goods which were either locally unavailable or available in insufficient quantities.

**Table 1**

**Brazilian Production, Imports and Consumption of Crude Steel in 1940, 1950, 1960 and 1964 to 1967**  
(in thousands of metric tons)

	1940	1950	1960	1964	1965	1966	1967
Production	141.2	788.6	2,279.0	3,015.7	2,983.0	3,745.2	3,674.5
Imports	368.7	363.5	539.0	618.0	304.0	406.3	.
Consumption	509.9	1,148.0	2,802.8	3,647.0	2,900.0a	3,000.0a	.

a = Estimated

Source: IBGE, Boletim Estatístico, current annual issue, BNDE, quoted in: BANAS, Mineração, siderurgia, metalurgia, 1965, p. 45, and IBS, Boletim IBS, ano V, no. 29 (Janeiro de 1968, p. 24-25).

Admittedly, genuine competition between local and foreign products was eliminated through a policy of substitution which further strengthened the traditional reluctance on the part of Brazilian firms to face competition. Then there was the inflation which, though no uncommon occurrence in Brazil, progressed at an ever more rapid pace with the result that the financing of new projects was planned on a more generous scale than in times of stable money. Even so the estimated capital requirements for projects that took longer to mature were often so far overtaken by the soaring prices that new capital for the building of enterprises became necessary. In two cases where new firms were to be started in the heavy industry sector the foreign investors concerned had to come to the conclusion that their original calculations were too low and that more capital would have to be invested. But as they were not prepared to increase their shares in the capital and as there were no other private investors willing to participate, the Brazilian Government finally became the biggest shareholder in these already far advanced projects. In this manner the Government's share in the heavy industry was willy nilly increased further, reaching as early as 1964 70 per cent in the country's crude steel output.

Those works which were already in production had, on the other hand, hardly any difficulties during the development phase. Local industry could expand without any risk as long as the fast pace of development guaranteed an ever increasing demand for iron and steel products, as long as the home market remained closed to any genuine foreign competition and, finally, as long as the inflationist attitude of Government and economy permitted them to escape into higher prices.

### Neglect of Efficiency

A policy of industrialisation, the closing of the home market to foreign competition and inflation, however, brought in their wake other problems which in the long run proved important to the heavy industry and those other branches of industry which depend on it. As the substitution of imports was the main purpose of all new industrial enterprises, it became the practice to put up with any defects, provided that the main purpose was served. The criterion of economic efficiency was frequently neglected in planning new enterprises. There were, particularly in the public sector, a number of enterprises which operated with so little efficiency that they had to be subsidised for years to be able to exist at all. The economic nationalism, which after all prevailed not only in Brazil, and the enthusiasm for industrialisation clouded the view and prevented a proper appreciation of the requirements of a rational economic policy. One was inclined to overlook that the situation of an industry that was created in such circumstances was liable to worsen considerably as soon as one or several of three preconditions—high partial growth rates, import embargoes and inflation—ceased to exist.

During the development phase there was much discussion of whether the Government's share in the iron and steel production would continue to grow. The state had already attained a prominent position in the heavy industry when the Volta Redonda Works was founded—a position which became dominating when it was forced to support the above-mentioned two projects in that sector. Evidently, the state did not plan to monopolise the entire industry as it had done for instance in the case of the petroleum industry through the government-operated "Petrobras". On the other hand, the Government did not seem averse from exercising that greater influence which it had acquired with its greater stake in the industry's output.



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Eventually, as time went on, more importance was being attached to the question of the pace at which the Brazilian heavy industry should expand. Even in the event of a deterioration in the country's economic conditions measures would have to be taken to ensure that in the long run it would be adequately supplied with heavy industrial products. Beyond that a decision had to be taken on how far the heavy industries were to be geared to produce goods for export whenever the internal situation permitted it or an economic recession or foreign trade considerations made such exports desirable. (Chile for example has always been exporting its iron and steel products insofar as they were surplus to its own requirements). Brazil possesses the most extensive ore deposits in the whole of Latin America, and its heavy industry has the largest output potential. Yet, before it could think of establishing a steady export business, the country would have to make its products competitive as far as prices are concerned.

### The Test of the Deflationary Period

After the revolution of 1964 the fight against inflation ceased to be a mere slogan and became an actual part of the Government's policy and thus also brought about a change of conditions in the heavy industry. The long-term economic trend pointed in the direction of continued increases in the demand for heavy industrial goods. On the other hand, economic policy had changed; the Government's aims were to stabilise prices and wages, to balance the budget gradually, to reorganise the currency, to increase the revenue from taxation and to intervene on a larger scale than before in the country's economic affairs. All this made the position of the heavy industries more difficult, particularly in view of the fact that the credit sector did not see its way to reducing its actual interest rates.<sup>1</sup> The President of Usiminas noted the fact that in 1967 for instance the actual production costs for Brazilian plate per ton were 19 per cent below the equivalent costs in the United States. Yet, the selling price for the Brazilian product was 30 per cent higher, not least because of the high interest charges and the heavy taxation burden the Brazilian industry had to bear. But there were also other factors at work such as the differences in the relative competitive positions and in the price elasticities and, above all, the cumulative cost increases. Gone were the times of galloping inflation; no longer was it possible for the management of a Brazilian firm to finance its business largely out of profits. Now management, having failed in its repeated attempts to get the Government to agree to an adjustment of selling prices to the higher costs, was forced into the much dearer money market.

In the last few years the industry suffered losses which were attributable to the following causes: a shrinkage of demand because of the deflation, the

<sup>1</sup> These interest rates averaged 5 per cent per month; they were much higher than those prevailing in industrial countries because of the shortage of capital and because of the inflation.

appearance on the home market of foreign competitors who had been enabled to come in by the lower customs duties, the failure on the part of home producers to compensate for the shrinkage in home demand by entering the export field<sup>2</sup> and,

**Table 2**  
**Brazil's Metallurgical Industry during the years**  
**from 1964 to 1966<sup>1</sup>**

	1964	1965	1966
Persons Employed	250.6	(in 1000) 242.4	327.5
Wages Paid	141.6	(in mn US \$) 171.8	269.2
Consumption Expenditure	384.6	503.6	—
Expenditure on Raw Materials alone	325.0	424.8	—
Production Value	816.4	1,053.9	1,778.6
Raw Material Stocks	93.2	104.0	—
Stocks of own Products	57.7	63.8	—
Foreign Investments in Brazil's Heavy Industry <sup>2</sup>	81.0	—	155.0

<sup>1</sup> The figures apply to the entire metallurgical industry, of which the share of the iron and steel industry amounts to roughly 95 per cent.

<sup>2</sup> Only new investments in iron and steel production.

Source: Anuario Estatístico do Brasil 1967, pp. 143, 171, 319.

finally, the threat of a price war among the Brazilian steel producers. In 1967 the losses incurred by the state sector of the heavy industry alone amounted to 370 mn New Cruzeiros (roughly US \$ 115 mn). How much the private sector of the industry lost in the same period is so far not known. Although experience has shown private firms to be better managed than state-operated enterprises, it is reasonable to assume that, given the situation in the heavy industry and the general situation in the Brazilian economy, they, too, must have sustained losses.

High interest rates, heavy taxation, the collapse of the boom and increasing foreign competition—all the factors that have been dealt with so far—do not adequately explain the losses which the industry itself rightly describes as "decapitalisation". To arrive at a full understanding of the situation it would also be necessary to have a close look at the cost structure of the enterprises concerned and to examine the calculations on the basis of which the works in question was built on its present site. But even without such an examination it is fair to assume that autarkic-nationalist tendencies and inflation-induced euphoria played a larger part in starting a new enterprise than precise economic calculations and were therefore to a not inconsiderable extent responsible for the difficulties the sector has been experiencing.

### Moderate Expansion in the Future

Brazilian economic and Government circles have not allowed themselves to be deflected from their determination to build up their industry by the losses incurred by the heavy industry whether they be regarded as a bad awakening from an expansionist pipe dream or as an incentive to change the structure of a branch of industry resting on an insufficiently

<sup>2</sup> Brazilian products could be sold only at prices below production costs.

solid base or as a mere deflation-induced recession. Nor have they been deterred by justified doubts as to the industry's competitiveness in the world market.

Plans for Brazil's industrial development must make provision for the creation of a number of jobs sufficient for a population which by 1965 had increased to 82.2 mn and which is still growing at the rate of 3.5 per cent per annum. The most important point in the "Alliance for Progress" programme is the need to raise the income per head of population by at least 2.5 per cent every year. All these requirements, if they are to be met, will lead to such a rise in steel consumption that the present output capacity of the heavy industry must be considerably increased whatever its structural weaknesses.

As early as 1965/66 a committee of experts, on which the World Bank and the International Finance Corporation were represented, came to similar conclusions when they considered an "expansion programme" worked out by the North American specialist firm of Booz-Allen & Hamilton International ("Bahint"). Their programme envisaged for the period from 1966 to 1972 an increase of nearly 200 per cent in Brazil's crude steel capacity. This increase was to be achieved by expanding the existing works and by the creation of additional ones on new sites. In the meantime the Government has changed, and not much more was heard about the expansion programme until March 1968 when the new Brazilian Government under President Costa e Silva and the Minister of Trade and Industry, Macado Soares, an expert in matters concerning heavy industry, announced a new, modified programme for the years 1968-1970/71. This programme envisages investments amounting to US \$ 598 mn and an increase in crude steel capacity by 1.871 mn tons. Roughly 80 per cent of the increase is to be shared by the three largest government-controlled enterprises (Volta Redonda plus 250,000 tons, Usiminas plus 776,000 tons and Cosipa plus 385,000 tons). Taking 1967 as a basis, the planned increase of 40 per cent would give a capacity of 6.511 mn tons. This, according to the most careful calculations, should cover Brazilian requirements of steel in 1970/71.

#### **New Ten-Year Plan**

A new export-orientated production plant is to be erected, possibly at the iron-ore port of Tubarão near Vitória in the State of Espírito Santo. Plans have been worked out for a plant there with a capacity of 1.5 mn tons of crude steel. By making use of the existing rail facilities which belong to the state-owned mining company, the Companhia do Vale do Rio Doce, high-grade ore could be brought to the location of the new works from Minas Gerais, while good coking coal could be brought to Tubarão by North American freighters which take on ore at that port. The site therefore lends itself particularly well to the production of internationally competitive steel. Nothing is said in the programme about the other heavy industry projects in various regions of Brazil, though they are occasionally mentioned in passing.

The purpose of the planned large-scale investments is not only to expand output capacity; these investments are primarily to be used to reconstruct and rationalise state-controlled enterprises.

In May 1968 a ten-year plan was announced which envisages for the years 1968-1977 an increase in crude-steel capacity by 150 per cent to 11.533 mn tons. When one comes to analyse the manner in which the larger output capacities are to be distributed among the most important works one notices that the increase envisaged for the oldest and largest of the state enterprises, the Volta Redonda (Companhia Siderúrgica Nacional), is only 79 per cent, while the additional capacities expected of the Usiminas and Cosipa is 236 per cent and 225 per cent respectively. Of particular importance is furthermore the creation of an Advisory Council for the Heavy Industry, the "Conselho Consultivo da Indústria Siderúrgica"—"Consider" for short. This Council is to meet under the chairmanship of the Minister of Trade and Industry; it will consist of representatives of the iron and coal mines and of the heavy industry as well as of other experts, and it is to have a voice in determining the lines along which the heavy industry is to develop. It will be for the Council to coordinate the interests of the state-controlled works, while keeping watch over expansion programmes, sales policy and prices of the steel industry. Further plans include—apart from a holding company for the state enterprises (BRASSIDER)—the establishment of a fund for the financing of government as well as private enterprises of this industry and the creation of an umbrella organisation for private firms.

#### **Industrialisation Policy Changes Course**

The only moderate expansion of output capacity now planned for the heavy industry, the unproportionate distribution of additional capacity among the three most important enterprises in government hands<sup>3</sup> and the naming of only one single location as being—possibly—particularly suitable for a new plant—all these are indications pointing to a basic change in Brazil's policy of industrialisation. The saving of foreign currency on imports apart, it would appear that greater stress is henceforth to be laid on the need to increase efficiency and that a more sober view has replaced the blind urge to expand purely for nationalist reasons—a tendency that had been fostered by the inflation. The various advisory and coordinating bodies should also be helpful in putting the heavy industry on a sounder basis.

The already existing output capacities are also important realities, even if at worst they may still have to be supported by the taxpayer for some time to come, for they have pointed the way along which industrialisation must proceed. Brazil is today the biggest producer of steel in Latin America and likely to stay in the lead in future.

<sup>3</sup> Already in the "Bahint"-report of 1966 it was estimated that Cosipa required the equivalent of US\$ 135 additional capital for each additional ton of crude steel to be produced. The equivalent figure for Usiminas was US\$ 146 and that for Volta Redonda US\$ 232.