



Chinese iron ore and royalty

By Chuanming Tian

This article studies the competitiveness of a product and divides it into two levels. The first one is named *Defending competitiveness* (DC), which is defined as the ability to resist import of a foreign similar product. The second one is *Offensive competitiveness* (OC), which is defined as the ability to export. The article reviews the state of cost and tax of Chinese iron ore in 1993 and predicts possible situation of cost and tax of Chinese iron ore in 1994. Finally, the competitiveness of Chinese iron ore is based on analyses of cost and tax. A conclusion is that royalty weakens the competitiveness of Chinese iron ore.

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In December of 1993, the State Council of People's Republic of China issued royalty rules for mineral resources including iron ore. They stated that beginning from the first day of 1994, royalty would be imposed for extraction of all kinds of mineral resources in the territory of China. The clause in the rules related to iron ore stipulate that 2 to 30 CNY (yuan, 1 yuan equals approximately 0.12 USD) will be paid as royalty to Chinese government per t iron ore mined. Instead of being fixed, royalty rate falls into a range of 2 to 30 CNY due to variation of iron ore deposit quality.

In China, salable iron ore product is commonly concentrate. For the sake of convenience, the royalty rate for iron ore is transferred from iron ore to iron concentrate. On the basis of distribution of iron deposit quality, average royalty rate over China is calculated at about CNY 16 per t iron crude ore. Owing to the fact that in China, one t iron concentrate need consume 3.3 t iron ore, average royalty rate is about 52 CNY/t iron concentrate (USD 6).

Operating cost and tax in 1993

Royalty has not been levied for extraction of most mineral resources until the 1994. The last year without royalties for most mining companies was 1993. Compared with the previous year, production cost of iron ore in 1993 increased greatly. According to the statistics over nationwide iron mining companies, CNY 170.5 (USD 19.6) was the production cost per t concentrate (containing 62 per cent Fe) in 1993, up 60 per cent compared to 1992, CNY 25 (USD 2.9) and CNY 12.5 (USD 1.45) were respectively non-production cost and tax for unit iron concentrate. Therefore the sum of operating cost and tax in 1993 was CNY 208 (USD 23.9).

Operating cost and tax of in 1994

Due to inflation and the new royalty rules operating cost of Chinese iron ore will go on climbing in 1994. Under controlling

and adjustment of Chinese government in the past several years, inflation rate in China has dropped into a normal range of around 15 per cent. Assuming a inflation rate of 15 per cent, production cost will rise to CNY 196 (USD 22.5). As the Chinese government has been controlling expanding of non-production expenditure of state-owned iron ore miners since 1992, the non-production cost may be considered to be constant or reduced compared to 1993, namely CNY 25 (USD 2.9). The most important factor that will affect operating cost of Chinese iron ore in 1994 is royalty, up to CNY 52 per ton (USD 6) will raise unit operating cost to CNY 273 (USD 31.4), which means that after-royalty operating cost of Chinese iron ore will increase by about 31 per cent compared to that before-royalty. Taxation for mining companies in 1994 will differ from that in 1993. Instead of circulation tax taken in past years, value-rising tax will be main tax item in present year. According to new tax regulation, it is estimated that CNY 39 (USD 4.5) will be paid as tax by miners for per ton iron concentrate.

Cost of imported iron ore

In recent years, China has imported a large amount of iron ore from Australia, Brazil, India, South Africa and Peru as domestic supply of iron ore can not meet demand. For several years, the annual import of iron ore has been twenty to thirty Mt. Import cost of iron ore generally consists of money for buying the mineral material, freight, insurance for shipping, port fee and domestic transport charge. At present, the price in the international market is normally in the form of FOB, namely including all expenses before the carrying ship leaves a port. International transportation of iron ore generally means ocean shipping. The freight rate which is commonly accepted is FIO that means in and out ship expenditures for goods is not included in freight. Port fee mainly refers to the expenses in the unloading port, including tariff for im-



The Nanfen iron ore mine in Northeastern China.

porting iron ore, port-using expense, discharging fee and others. Since the main Chinese iron ore port, Ningbo Port, in which docks are capable of berthing over 100 thousand dwt vessel is far away from the main Chinese steel mills, imported iron ore has to be transported over a long distance within China.

As an example a shipment of iron ore from Peru in February 1994 cost 12.980 USD/t, the freight 12.400 USD/t, the insurance 0.061 USD/t and the port fee 6.930 USD/t, the second shipping 5.730 USD/t, which total 38.100 USD/t.

As more than half of the annual amount of imported iron ore comes from Australia, India, South Africa that are much closer to China than Peru and Brazil, average cost of importing iron ore is less than that showed in this example. According to statistics from Chinese customs, pre-duty importing cost is 30 USD/t, after-duty cost about 35 USD/t.

Theory of competitiveness

The competitiveness of a product can be divided into two levels. The first is its ability to compete with imports, the second is its ability to force its way into foreign markets. In this article these two abilities are respectively called *Defending competitiveness* (DC) and *Offensive competitiveness* (OC). DC is the most ru-

dimentary requirement of a competitive product. The most ideal product that can be considered highly competitive ought to be one which meets requirement of OC. However, it is difficult for many states, particularly most of developing countries in which industries have been undeveloped, to produce products that have OC. Therefore, that is an important contribution to domestic economy for those developing countries if most of products manufactured by themselves have DC.

Any nation has not only a defending side that needs to resist imports, but also an offensive side that, from time to time, wants to use its goods as weapon to attack other countries. Competitiveness is a defending shield as well as an attacking spear.

A product manufactured by first country is defending-competitive if total domestic cost of making the product is lower than the average importing cost of the same product manufactured by other countries.

A product made by first country is offensive-competitive if it in the second country's market, exporting cost of the product from first country is lower than production cost of the product manufactured by the second country, or lower than exporting cost of the product made

by other countries excluding first and second countries.

Under this definition, a necessary condition for a product produced by the first country to have DC is

$$C1 = P1 < C2 = P2 + F2$$

where C1 and P1 respectively denote cost and production cost of a products in first country, C2, P2 and F2 respectively cost, production cost and exporting cost of the product produced by the second country.

At the same time, a necessary condition for a product produced by the first country to have OC is

$$C1 = P1 + F1 < C2 = P2$$

or

$$C1 = P1 + F1 < Cn = Pn + Fn$$

where Cn, Pn and Fn are respectively cost, production cost and exporting cost in the nth country excluding first and second countries.

Referring to the product of Chinese iron ore, we also evaluate its two levels of competitiveness. Due to low grade of iron ore and huge domestic demand, it is little possible and also not much necessary for China to export iron ore. As discussion, further assessment on Chinese iron ore's OC is also developed here.

Defending competitiveness

Besides production cost, non-production cost are large in China. The non-production cost mainly consists of public expenses such as contribution to local government or its agencies and local community. Royalty as a kind of tax in China that has been levied since the first day of 1994 is different from other taxes such as value-rising tax, depletion allowance and income tax in practical operation of levying. Other taxes are levied at the time of sale, royalty however at the time of extraction. Due to this difference, royalty is included in the category of cost in this article. Thus C1, total domestic cost of Chinese iron ore, comprises of three parts, namely production cost, non-production cost and royalty.

$$C1 = P1 + B + T$$

where P1, B, T denote respectively total domestic cost, production cost and royalty.

On the other hand C2, total cost of importing iron ore, is

$$C2 = P2 + F2$$

where P2, F2 represent respectively domestic production cost and exporting cost of iron ore imported into China.

Given in preceding sections that under before-royalty, P1 is 19.6 USD/t, B is 2.87 USD/t, T is zero; under after-royalty, P1, B, T are 22.53 USD/t, 2.87 USD/t and 5.98 USD/t respectively. Substituting for the data we attain before-royalty, C1 = 22.5 USD/t after-royalty and C1 = 31.4 USD/t

Pre-duty cost of importing iron ore is 30 USD/t in which are included net profits, shipment fee, insurance and the expenses in Chinese unloading port except production cost. Shipment fee from Peru to China is 12.4 USD/t in the previous example. Considering that more than half of the total importing iron ore is from the much closer countries, and the freight from these countries to China being in the range of to 8 USD/t, we calculate weighted average freight is about 9 USD/t. As other expenses such as insurance, unloading port fee are generally the same we can quote the data stated in the example of importing from Peru. We also know that the ratio of net profit to production cost (RPP) for Brazil and Australia in 1993 are 11.3 per cent and 18.3 per cent respectively. Taking the annual import of iron ore as weight, we derive weighted average RPP of 16 per cent. Deducting the other expenses from the

Table 1

Average price of iron ore in Japan (USD/t)

| | Australia | Brazil | India | South Africa | Chile | Canada |
|--------------------|-----------|--------|-------|--------------|-------|--------|
| Fine | 17.0 | 16.7 | 17.3 | 13.8 | 12.8 | — |
| Concentrate | — | 13.8 | — | — | 16.0 | — |

pre-duty cost of imported iron ore, the production cost is 11.76 USD/t. Therefore P2 = 11.76 USD/t and F2 = 15.99 USD/t. Substituting for the data we derive C2 = 27.75 USD/t. Compared with C1 before-royalty C1 = 22.5 < C2 = 27.75 and after-royalty: C1 = 31.4 > C2 = 27.75.

This means that before-royalty, Chinese iron ore is defending-competitive, after-royalty, Chinese iron ore is not DC.

Offensive competitiveness

Japan is considered as an export market of Chinese iron ore. There were nine nations which exported iron ore to Japan in 1993: Australia, Brazil, India, Canada, Chile, Mauritania, New Zealand, Peru and South Africa. Chinese iron ore will compete with ore from these countries if exporting to Japanese market. Peru's and New Zealand's products, iron sand and pellets, cannot be compared with the Chinese iron ore product, concentrate. Average price in Japanese market in 1993 are showed in the table 1. Average freight rates from the countries in table one to Japan in 1993 are showed in table 2.

Since the only differing part of exporting cost to Japan are iron ore price and freight rate, it is enough to compare these parts which are defined as comparable cost here. Table three shows the comparable costs.

Assuming that 10 per cent is RPP of Chinese iron ore. As the shipment distance between China and Japan is only one fourth of that between Australia and Japan, at the same time in consideration of poor port and ship condition, we can reasonably assume freight rate from China to Japan is 5 USD/t. Thus, comparable exporting cost of Chinese iron ore can be estimated. Some results of Chinese iron ore are stated as following:

before-royalty: domestic cost-22.6 USD/t, exporting price 24.7 USD/t, comparable cost = 26.7 USD/t.

After-royalty: domestic cost 31.4 USD/t, exporting price 34.5 USD/t and comparable cost 36.5 USD/t

Compared with data in table 3 the results show that Chinese iron ore has not OC in neither before- nor after- royalty conditions.

Conclusion

Chinese iron ore is not offensive-competitive but will be of higher defending-competitiveness under circumstances of free royalty and will lose defending-competitiveness if royalty is imposed.

Taxation is one of important measures that have been taken by governments in many nations to carry out their industry development policy whose aims are to encourage those industries with good

Table 2

Average freight rates of iron ore to Japan in 1993 USD/t

| | Australia | Brazil | India | South Africa | Chile | Canada |
|---------------------|-----------|--------|-------|--------------|-------|--------|
| Freight cost | 5.0 | 10.0 | 7.5 | 8.5 | 10.0 | 5.5 |

Table 3
Comparable costs of iron ore in Japan in 1993, USD/t

| | Australia | Brazil | India | South Africa | Chile | Canada |
|-------------|-----------|--------|-------|--------------|-------|--------|
| Fine | 23.0 | 26.7 | 24.8 | 22.3 | 22.8 | – |
| Concentrate | – | 23.9 | 21.3 | – | – | 21.5 |

prospects and restricting those industries with bad futures. Tax policy in any country should reflect these aims. For example agriculture products versus France, sound and film products versus USA, and rice versus Japan are promoted. Agriculture in France is one of the industries that need be promoted, so French government have pursued a policy of low tax and subsidy to its farm product export. Similarly, USA and Japan have refused to make a concession to international outcry against their policies of low tax and subsidy to their respective advantage product.

Iron ore in China should be included into the category of promoted products because, first, iron ore resources are plentiful with more than 50 billion t geological reserve. Although Chinese iron ore is characterized by low grade (average 33 per cent), it can be mined profitably with better operation and management. Secondly, iron ore needs of the large development of Chinese steel output must mainly depend on domestic supply, and partly on imports because China has a limited foreign exchange reserve and has weak ability to earn foreign exchange. If introduction of new technologies and devices is more urgent than import of raw materials, it is not wise to spend a large amount of foreign exchange importing more iron ore than at present. Thirdly, Chinese iron ore mining industry is among the advanced in the world, and it has been in operation with good technology and huge production capacity for decades. Rich experience in operation and management has been ac-

cumulated for the industry. Fourthly, it gives millions of employment posts. Therefore, Chinese iron ore industry should be promoted and supported. One of concrete measures, no doubtly, is a policy of low tax. Obviously, present high royalty in operation is opposite to the requirement.

Royalty is common in many market-oriented countries and has been put in operation for long time. The aim of royalty is to compensate consumption of natural resources and prevent the mining industry from careless mining. From the view of theory, it is right to carry out royalty policy. However, royalty policy cannot be carried out ideally before property right of mineral resources is clarified between government and the mining industry in China. Under ambiguous relationship of property right it is difficult for mining industry owned and run by the state in China to keep profit making level not throughout forcing up the prices of iron ore because Chinese miners have undertaken much responsibility such as collective welfare, social basic installation, which ought to be borne by Chinese government. Thus, Chinese miners perhaps have only a way of rising prices of iron ore to go after high royalty is imposed, this no doubtly will result in Chinese iron ore's losing DC. In a word, royalty should be imposed, but the present is not appropriate time in China.

Brazil can be taken as an example to illustrate this matter. Encouraging policy of low tax for iron ore mining industry had been carried out in Brazil before 1989. The policy gave impetus to Brazil-

ian iron ore industry so powerfully that Brazilian iron ore became more competitive than that from its main rival Australia. Nevertheless, Brazilian iron ore has become less competitive compared with Australian since 1989 because of canceling of low tax policy by Brazilian government in order to increase fiscal revenue. The change in tax policy makes Brazilian iron ore lag behind Australian iron ore in beneficial results. It is reported that in 1993, the second largest iron ore mining company MBR paid 60 MUSD in tax on its 23 Mt/year iron ore output, and tax payable by the first largest iron ore mining company CVRD rose to 125 MUSD a year on a production capacity of 55 Mt/year of iron ore. The unit tax in terms of USD per ton mined iron ore payable by CVRD and MBR were 2.27 and 2.61 respectively. The high tax have reduced net earning on iron ore production in Brazil to some 11.3 per cent of production cost, compared to 18.3 per cent in Australia.

China should not follow in Brazilian foot-steps in the policy related to iron ore. Chinese iron ore will be defending-competitive if royalty is not or not much levied, and will possibly be offensive-competitive under free royalty together with other measures. ■