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BAUXITE, ALUMINA AND ALUMINIUM AND THE URUGUAY ROUND

Report by the UNCTAD secretariat

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CONTENTS

I. INTRODUCTION

1. This report assesses the likely effects of the Uruguay Round Agreements on the world market for bauxite, alumina and aluminium. Section II reviews trends in trade during the period 1972 to 1994. This period was considered to be of sufficient length to allow long-term trends to be identified. Section III describes and attempts to assess the significance of trade measures during the period studied. Section IV reviews tariff changes resulting from the Uruguay Round and evaluates the significance of these changes. Finally, the outlook for world trade in bauxite, alumina and aluminium is briefly discussed.

2. The tables in the statistical annex show the evolution of exports and imports at different stages of processing. In order to smooth out year-to-year variations, three-year averages 1972-74 and 1992-94, have been used. Data on exports and imports are from the UNCTAD Commodity Yearbook and the UNCTAD Handbook of World Mineral Statistics (to be published shortly). Import and export quantities are expressed in metric tons gross weight of the product shipped; that is, not in terms of alumina or aluminium content. Data on tariffs and non-tariff measures prior to the Uruguay Round are from the UNCTAD TRAINS database. Information on post-Uruguay Round tariffs are from the World Trade Organization. Throughout the text, products are designated by their Harmonized System (HS) numbers. The following products are included:

- Bauxite, HS 260600
- Alumina
  - Aluminium oxide, HS 281820
  - Aluminium hydroxide, HS 281830
- Unwrought aluminium
  - Not alloyed, HS 760110
  - Alloyed, HS 760120
  - Waste and scrap of aluminium, HS 7602
  - Aluminium powders, HS 7603
- Semifabricated products of aluminium
  - Bars, rods and profiles, HS 7604
  - Wire, HS 7605
  - Plate, sheet or strip, HS 7606
  - Foil, HS 7607
  - Tubes and pipes, HS 7608
  - Tube and pipe fittings, HS 7609

II. TRENDS IN TRADE, 1972-74 TO 1992-94

1. Bauxite

3. Bauxite, the main raw material used to produce aluminium, is composed of one or more aluminium hydroxide minerals and impurities of silica, iron oxide and titanium. Grades of bauxite and their different applications are determined by the percentages of alumina, silica, titania and iron they contain. A high aluminium oxide (alumina) content is desirable in practically all uses of bauxite. At least 80 per cent of world bauxite production is from surface mines, with the rest, mainly in southern Europe, the former USSR republics and Hungary, from underground mines. Unlike other base metal ores, bauxite does not require complex processing because most of the ore mined is of an

acceptable grade or can be improved by a relatively simple process of removing clay.

4. World exports of bauxite (HS 260600) increased at an average annual rate of 0.5 per cent from 1972-74 to 1992-94. The value of total annual exports in 1992 to 1994 was between 800 and 900 million US dollars. The slow rate of growth is mainly explained by the fact that bauxite producers have increasingly tended to refine the bauxite to alumina before export, since transportation costs constitute a major part of the price for bauxite paid by consumers. While freight charges for alumina tend to be higher than for bauxite, given the need for specialized vessels and handling facilities, the reduction in volume by about half provides a major saving (alumina content of bauxite varies from about 30 to 60 per cent; internationally traded bauxite usually contains at least 45 per cent aluminium oxide). Slightly over 30 per cent of world bauxite production is internationally traded. About 90 per cent of bauxite production is refined to alumina, while the rest is used for various purposes, including abrasives and chemicals.

5. Developing countries' share of world bauxite exports increased from 72.1 per cent in 1972-74 to 81.8 per cent in 1992-94, while the share of developed market economy countries fell from 25.9 to 17.5 per cent (table 1). Factors behind the changes were dramatic increases in Guinean and Brazilian bauxite production and exports. To some extent, these increases were offset by reduced exports from other developing countries, including the Dominican Republic (where production ceased in 1991), Haiti (production ceased in 1982), Jamaica, Suriname (which stopped exporting bauxite in 1989 and is now refining its entire bauxite production into alumina), Malaysia and former Yugoslavia. The decline in export shares of the Caribbean countries is considered to have been at least partly caused by government policies regarding taxation and foreign investment. The decline in the share of developed market economy countries was mainly caused by increases in alumina refining capacity in Australia (which resulted in less bauxite being available for export) and by reduced production in Greece.

6. The share of developed market economy countries in world bauxite imports decreased from 89.7 per cent in 1972-74 to 76.2 per cent in 1992-94, mainly as a result of closures of alumina refineries in Japan and the United States (table 2). The European Union (12 countries) increased its share of imports considerably, mainly owing to the establishment of new refineries in Ireland, Italy and Spain. The increase in the share of developing countries from 1.2 to 6.1 per cent of world bauxite imports was mainly due to increased Venezuelan imports as the Interalumina refinery came into production and domestic bauxite capacity was insufficient to meet the needs. The USSR and, later, the Russian Federation, also increased its share of world imports as it became increasingly difficult to assure refineries of domestic deliveries.

2. Alumina

7. Bauxite is converted to alumina (aluminium trioxide) through the Bayer process. In this process, concentrated caustic soda is used to extract alumina from bauxite at elevated temperatures and pressures. This produces a slurry which consists of a super-saturated aluminate

solution and a solid phase commonly called red mud or bauxite residue. This residue is separated from the saturated aluminate solution, which is cooled and seeded to induce crystallization and precipitation. The crystals generated from precipitation are washed and calcined to remove water.

8. World exports of alumina (HS 281820 aluminium oxide and 281830 aluminium hydroxide) increased at an average annual rate of 3.7 per cent from 1972-74 to 1992-94, or at a somewhat higher rate than world production (2.8 per cent), reflecting the shift in alumina refining capacity from consuming countries (those with aluminium smelting capacity) to bauxite producing countries. The total value of exports was about US$ 3,900 million in 1992-94. Almost half of world alumina production enters international trade.

9. Developed market economy countries' share of world exports increased from 52.6 per cent in 1972-74 to 63.4 per cent in 1992-94, mainly owing to the expansion of alumina refining capacity in Australia, which increased its share of exports from 32.2 to 44.1 per cent (table 3). The European Union (12 countries) also increased its share as a result of new capacity in Ireland, Italy and Spain. The share of developing countries fell, since no new capacity for export was added during the period. Those additions to capacity that took place, for instance in Brazil, India and Venezuela, were intended to supply aluminium smelters in these countries. It should be noted that figures for developing countries for 1992-94 include exports from Kazakstan to the Russian Federation (1 million tons), which were of course considered as intra-USSR trade in 1972-74. The same applies to exports from Ukraine to the Russian Federation (800,000 tons).

10. The share of developed market economy countries in world imports of alumina declined from 79.2 per cent in 1972-74 to 58.3 per cent in 1992-94 (table 4). Decreases in the United States, Norway and Japan reflected the reduced share of these countries in world primary aluminium production - in the case of Japan, the almost complete elimination of its aluminium smelting industry - while in the European Union, the reduced share resulted from both increased alumina capacity within the Union and a reduced share in aluminium production. Canada increased its share of world alumina imports as a result of a massive increase in primary aluminium smelting capacity, particularly in the later part of the period. The share of developing countries increased dramatically, from 8.7 to 26.3 per cent, as aluminium smelters were built in energy-rich countries such as Brazil, Egypt and Indonesia (based on hydroelectric power), and Bahrain, Islamic Republic of Iran and the United Arab Emirates (based on thermal power using oil and natural gas). China also emerged as an important alumina importer during the period, accounting for 5.5 per cent of world imports in 1992-94. It should also be noted that 1992-94 figures for developing countries include imports by Tajikistan, which were previously included in USSR import figures. The large increase in imports by the Russian Federation is partly due to the inclusion in 1992-94 of imports from Kazakstan and Ukraine, which were previously counted as intra-USSR trade. Imports by the Russian Federation from other countries did, however, also increase significantly.

3. Unwrought aluminium

11. Primary aluminium is produced by electrolytic reduction of alumina

using the energy-intensive Hall-Héroult process. Alumina is dissolved in a molten cryolite bath and electrolysed in a reduction cell by direct current. Alumina is added to the molten bath in the cell and dissolves as the electrolysis proceeds. Fluoride compounds are also added to the bath as required to replenish material removed or consumed. Molten aluminium is periodically withdrawn from the cell by vacuum suction and cast into shapes.

12. World exports of unwrought aluminium (includes HS 760110 not alloyed and 760120 alloyed for the purpose of describing trade flows, while in the discussion of trade measures in the following chapter waste and scrap (HS 7602) and powders (HS 7603) are also included among unwrought aluminium) increased at an average annual rate of 5.7 per cent from 1972-74 to 1992-94, or at a considerably higher rate than world production of primary aluminium (2.5 per cent). The total value of exports was US$ 15,831 million in 1994. About 50 per cent of world primary aluminium production enters international trade. The high rate of growth in international trade reflects both the emergence of new production in countries whose comparative advantage derives from cheap energy (the energy-rich countries mentioned above) and which import alumina, and increased downstream processing in alumina producing countries (as seen from the fact that the rate of growth in aluminium exports exceeds that of alumina exports).

13. Developed market economy countries' share of world exports decreased from 71 to 57 per cent from 1972-74 to 1992-94, with Canada, the European Union and Norway experiencing falling market shares and Australia increasing its share (table 5). The share of developing countries increased dramatically, from 10 to 27 per cent, with Brazil and Venezuela registering the largest increases. The share of exports from countries of Eastern Europe decreased over the period, despite an increase in exports from the former USSR republics, in particular the Russian Federation, from 1991.

14. The share of developed market economy countries in world imports of aluminium increased somewhat during the period (table 6). This was entirely due, however, to the almost complete closure of the Japanese aluminium industry. The Japanese share of world imports increased from 12 to 23.5 per cent. In contrast, the share of the European Union declined from 49 to 31 per cent. The share of developing countries in world imports increased from 13 to 20 per cent, reflecting very large increases in imports by Asian countries. Finally, the share of countries of Eastern Europe fell dramatically as a result of the restructuring process in these countries.

4. Semifabricated products of aluminium

15. Semifabricated products (HS 7604 to 7609) are produced from unwrought aluminium (primary metal or scrap) through rolling, extruding or other processes. A large variety of products exists, and their prices vary significantly depending on the cost of processing.

16. Unfortunately, systematic data on trade in semifabricated aluminium products is available only from the year 1989 onwards. From 1989 to 1994, the volume of world exports of semifabricated products increased at an average annual rate of 8.3 per cent, reflecting the rapid globalization of the market for these products. Export value

increased at a lower rate of 4.3 per cent, owing mainly to the low price of aluminium in the latter year. Prices of semifabricated products are, generally speaking, linked either direcly or indirectly to the price of unwrought aluminium. The value of world exports of semifabricated products in 1992 to 1994 was between US$ 14,900 and 16,500 million. About a quarter of world production of semifabricated products is internationally traded and this proportion is increasing rapidly.

17. World trade in semifabricated aluminium products is still dominated by developed market economy countries, which accounted for 72.1 per cent of world imports and 87.4 per cent of world exports in 1992-94. Developing countries accounted for 25.4 per cent of imports and 10 per cent of exports, and countries of Eastern Europe for 2.5 per cent of imports and 2.6 per cent of exports (see table 7). Developing countries' imports are increasing rapidly, in particular in Asia and Latin America, while the increase in exports is slower and mainly confined to East Asia.

III. SIGNIFICANCE OF TRADE MEASURES

18. The only alumina producing countries levying tariffs on bauxite imports before the Uruguay Round were India (45 per cent) and Venezuela (5 per cent). India is self-sufficient in bauxite, while Venezuela imports part of its needs, mainly from Brazil.

19. Most alumina importing countries did not levy any tariffs on alumina prior to the Uruguay Round. Exceptions were the EU with a 5.5 per cent tariff (0 in the case of ACP countries and countries benefiting from the GSP), Argentina (5 per cent), China (20 per cent), Poland (10 per cent) and the Russian Federation (5 per cent).

20. Tariffs on unwrought aluminium (HS 7601) in countries importing significant quantities were generally low, although significant in China, the European Union, the Republic of Korea, Switzerland and Thailand (table 8). Other countries with significant tariffs were generally small importers of aluminium (Argentina, Austria, Hungary, India, Mexico, Russian Federation and Venezuela). Tariff rates on waste and scrap (HS 7602) were normally zero, with few exceptions, while tariffs on powders (HS 7603) were generally higher than on unwrought aluminium. GSP rates were generally zero on the main products traded. However, it should be noted that the European Union does not offer GSP treatment on unwrought aluminium or waste and scrap (the preferential rate for ACP countries is however zero). Tariff escalation from alumina to aluminium was generally modest, with no or a negative difference between rates in many cases. However, for countries benefiting from GSP treatment, the escalation was 4 per cent in Austria and 6 per cent in the European Union.

21. Tariffs on semifabricates (HS 7604-7609) were significant in most countries and territories except Hong Kong, Singapore and the Nordic countries. GSP rates were generally either zero or about half of MFN rates (see table 9). Tariff escalation from unwrought aluminium was significant (see table 10), but had not stopped new exporters from gaining some market shares. Under the Agreement on Trade in Civil Aircraft, certain aluminium semifabricates are imported free of duty into major markets such as the United States and the European Union.

22. Economies of scale are important at most stages of processing, with the exception being extruded products (essentially bars, rods, wires, tubes and pipes and tube and pipe fittings, HS 7604, 7605, 7608 and 7609). The scale advantages are probably a more important barrier to entry than trade measures, although the absence of detailed data over a longer time period in the case of semifabricated products makes it difficult to assess the importance of trade measures. Access to technology is also important. However, the technology is easily available at the early stages of processing, although the number of suppliers is limited. For some "niches", such as cansheet, entry to the market is effectively barred by technology factors.

23. Non-tariff measures (NTMs) are generally not important for trade in aluminium. The only significant instances in recent years when NTMs were applied were in June 1988, when the United States, responding to dumping charges from a United States producer, imposed a 5.8 per cent antidumping duty and a 38.4 per cent countervailing duty (changed to 5.5 per cent in 1990) on certain semi-manufactured products from Venezuela, and when the European Union imposed an import quota of 15,000 tons per month on unwrought aluminium from CIS states from August 1993 to February 1994. The quota was abolished as a result of the memorandum of understanding concluded in January 1994 between Australia, Canada, Norway, the Russian Federation, the United States and the European Union. Under the memorandum of understanding, the Russian Federation undertook to reduce its output of primary aluminium by 500,000 tons by 31 July 1994.

IV. OUTLOOK POST-URUGUAY ROUND

24. Tariff concessions for bauxite, alumina and aluminium in the Uruguay Round are generally small and are unlikely in themselves to lead to major changes in trade patterns (see tables 11A and 11B). Of countries with significant trade in the products concerned, a number made offers with higher rates than they already applied. This group included China, Indonesia, Malaysia (a lower offer was made for HS 7605 wire), New Zealand, the Philippines, the Republic of Korea (lowered rate on HS 7605 and 7606 and parts of 7604 from 11 to 10 per cent, however) and Venezuela. A few countries and territiories made no offer on these products. In addition to Hong Kong and Singapore, both of which already applied zero tariffs on all the products concerned, this was the case for Argentina and Brazil.Tariff escalation has diminished marginally. Erosion of preferences is relatively unimportant, given the small concessions, but could be significant for a couple of countries if European Union tariffs on unwrought aluminium were to be eliminated.

25. Significant changes in trading patterns are likely to result from factors other than the Uruguay Round, in particular the expansion in aluminium demand in South and East Asia. Table 12 shows projections of consumption of primary aluminium in the year 2000, based on extrapolations of the trends in consumption for most individual countries (those identified in the table; for others, projections have been made on the basis of consumption of the group as a whole) during the period 1980-1993. The trend for global consumption is 1.9 per cent per year, which is likely to be a low estimate. Consumption in the year 2000 for countries such as China and India is also likely to be

underestimated, since the base period was characterized by what in retrospect appears to have been years of low growth in these two countries. Nevertheless, even under these conservative assumptions, primary aluminium consumption in developing countries in Asia is shown to increase dramatically, expanding from 19.1 per cent of world consumption in 1993 to 27 per cent in 2000. The application of more realistic growth rates for the two countries mentioned would result in a considerably higher share for Asian consumption.

26. The projected increase in consumption from 1993 to 2000 is 6.7 million tons. Of this, about 1.5 million tons will probably be met by smelters (including in the Russian Federation) that introduced cutbacks in 1994/95. Capacity expansions under way or at the planning stage will account for another 4 million tons (see *Recent and planned changes i production capacity for bauxite, alumina and alumini (UNCTAD/COM/RDS/4)*). The rest, or about 1 million tons, will have to be met from projects that are at present only at the feasibility study stage. If these projects are to be implemented in time to meet the expected demand, investment decisions will have to be taken within the next two years at most. It is not at all certain that the decisions necessary to avoid a new shortage similar to the one that occurred in 1988 will be taken. Accordingly, the aluminium market is likely to experience a high degree of instability during the rest of the millennium.

27. As regards international trade patterns, the changes are likely to be dramatic. Developing Asian countries will, according to the projection, need an additional 3.3 million tons of primary aluminium per year in the year 2000, compared to 1993. Capacity additions since 1993 correspond to about 200,000 tons of annual production. Until the year 2000, another 900,000 tons will be added in projects which have advanced beyond the feasibility study stage. Annual imports of primary aluminium by developing Asian countries could thus increase by about 2.2 million tons to 4.2 million tons. The region's share of world imports of unwrought aluminium would grow from 18 per cent in 1992/94 to between 30 and 40 per cent in the year 2000 (the exact share depends on the distribution of new smelting capacity).

28. The above reasoning of course rests on the assumption that developing countries in Asia will not prefer to import semifabricated aluminium products or finished goods containing aluminium instead. It should be noted, however, that despite the relatively high tariffs levied by several of the countries concerned on semifabricates, countries and territiories such as the Republic of Korea, China and Taiwan province of China are relatively large importers of these products. Furthermore, it may not be possible to expand production capacity rapidly enough to meet the growth in demand. In this case, developing East and South-East Asia could become the world's most important market for semifabricates in the early years of the next decade (at present the region accounts for 19 per cent of world imports by value, while the European Union accounts for 48 per cent). Whatever the balance between unwrought and semifabricated imports turns out to be, it is clear that the projected developments give rise to important export opportunities for developing countries outside the region, in particular those countries which are already exporting unwrought aluminium and might be in a position to establish or expand downstream processing facilities. Intra-regional trade in semifabricates in Asia is also likely to expand significantly, since some of the smaller

countries in the region, which do not have large enough domestic markets to support the establishment of large semifabricates plants, are likely to source their imports from neighbours such as China, India, Indonesia, Thailand and other larger regional countries.

29. Given economies of scale, it is likely that a degree of specialization will evolve among countries producing semifabricates. This implies that international trade in semifabricated aluminium products is also likely to grow fast, not only in Asia but in general. Furthermore, "surplus" production from the "new" semifabricates producers in Asia is likely to find its way to other countries, in particular to developed countries. While tariff concessions for these products in the Uruguay Round were less than impressive, the new tariffs are likely to be low enough to allow a significant penetration of these markets by the new exporters.

Statistical annex

Table 1. World bauxite exports by major groups of countries, 1992-1974 and 1992-1994 Average, quantity in thousand tons and share in per cent

Group of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	8022.6	25.9	6016.3	17.5
Australia	6604.2	21.3	4919.7	14.3
Greece	1279.0	4.1	856.3	2.5
Developing countries	22338.3	72.1	28148.0	81.8
Guinea	1649.7	5.3	13633.3	39.6
Brazil	11.1	0.0	5159.7	15.0
Jamaica	7518.6	24.3	3934.7	11.4
Guyana	2267.2	7.3	2076.7	6.0
Sierra Leone	699.3	2.3	1016.7	3.0
Indonesia	1242.0	4.0	946.3	2.8
China	92.9	0.3	587.3	1.7
Ghana	342.2	1.1	406.7	1.2
Malaysia	940.6	3.0	142.0	0.4
Former Yugoslavia[a]	1718.0	5.5	0.3	0.0
Suriname	3900.0	12.6	0.0	0.0
Dominican Republic	1141.3	3.7	0.0	0.0
Haiti	628.1	2.0	0.0	0.0
Countries in Eastern Europe	626.7	2.0	261.3	0.8
Hungary	626.7	2.0	251.7	0.7
World	30987.6	100.0	34426.3	100.0

[a] Figures for 1992/1994 refer to the Federal Republic of Yugoslavia

Table 2. World bauxite imports by major groups of countries, 1972-1974 and 1992-1994 Average, quantity in thousand tons and share in per cent

Groups of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	27986.5	89.7	26883.0	76.2
United States	14279.5	45.8	12261.7	34.7
EU12	5591.9	17.9	9741.3	27.6
Canada	2658.7	8.5	2863.0	8.1
Japan	5307.7	17.0	1843.0	5.2
Developing countries	364.2	1.2	2165.7	6.1
Venezuela	3.0	0.0	1048.7	3.0
Azerbaijan	-[a]	-	433.3	1.2
Countries in Eastern Europe	2838.7	9.1	6249.3	17.7
Former USSR/Russian Federation[b]	1603.6	5.1	2990.7	8.5
Ukraine	-[c]	-	2500.0	7.1
Romania	394.2	1.3	516.7	1.5
Former Czechoslovakia[d]	467.2	1.5	197.7	0.6
World	31189.3	100.0	35298.0	100.0

[a] Included in the figure for the former USSR.
[b] 1972/1974 figures refer to the former USSR, 1992/1994 figures to the Russian Federation.
[c] Included in the figure for the former USSR.
[d] 1992/1994 figures include imports by the Czech Republic and by Slovakia.

Table 3. World alumina exports by major groups of countries, 1972-1974 and 1992-1994 Average, quantity in thousand tons and share in per cent

Group of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	5795.8	52.6	14337.8	63.4
Australia	3550.9	32.2	9969.7	44.1
EU12	1083.9	9.8	2911.3	12.9
United States	974.9	8.9	1160.4	5.1
Developing countries	4643.3	42.2	7150.1	31.6
Jamaica	2418.4	22.0	2952.5	13.1
Suriname	1188.7	10.8	1414.2	6.3
Kazakstan	-[a]	-	1000.0	4.4
Guinea	637.3	5.8	628.0	2.8
Guyana	278.0	2.5	0.0	0.0
Countries in Eastern Europe	574.2	5.2	1137.8	5.0
Ukraine	-	-	800.0	3.5
Hungary	574.2	5.2	331.0	1.5
World	11013.3	100.0	22625.8	100.0

Table 4. World alumina imports by major groups of countries, 1972-1974 and 1992-1994 Average, quantity in thousand tons and share in per cent

Group of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	8514.9	79.2	13055.1	58.3
United States	3160.7	29.4	3963.7	17.7
Canada	803.0	7.5	3060.8	13.7
EU12	1826.1	17.0	2749.6	12.3
Norway	1164.6	10.8	1741.6	7.8
New Zealand	210.6	2.0	507.6	2.3
Japan	546.9	5.1	109.0	0.5
Developing countries	932.5	8.7	5899.2	26.3
China	34.9	0.3	1227.8	5.5
Brazil	1.5	0.0	754.5	3.4
Tajikistan	-[a]	-	558.0	2.5
Bahrain	143.9	1.3	486.7	2.2
United Arab Emirates	0.0	0.0	423.2	1.9
Indonesia	9.5	0.1	423.0	1.9
Egypt	0.0	0.0	358.6	1.6
Argentina	8.8	0.1	303.4	1.4
Ghana	287.3	2.7	262.7	1.2
Mexico	103.5	1.0	64.8	0.3
Countries in Eastern Europe	1310.2	12.2	3446.8	15.4
Former USSR/Russian Federation[b]	829.1	7.7	3211.7	14.3
Poland	245.6	2.3	97.7	0.4
World	10757.7	100.0	22401.1	100.0

[a] Included in the figure for the former USSR.
[b] 1972/1974 figures refer to the former USSR, 1992/1994 figures to the Russian Federation.

Table 5. World exports of unwrought aluminium by major groups of countries, 1972-1974 and 1992-1994
Average, quantity in thousand tons and share in per cent

Group of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	2507.3	70.6	6056.1	56.6
Canada	693.0	19.5	1774.6	16.6
EU12	788.0	22.2	1411.7	13.2
Australia	68.2	1.9	982.4	9.2
Norway	555.8	15.7	819.2	7.7
United States	165.0	4.7	492.5	4.6
New Zealand	80.3	2.3	235.6	2.2
Developing countries	361.7	10.2	2877.5	26.9
Brazil	0.0	0.0	804.1	7.5
Venezuela	10.9	0.3	450.9	4.2
United Arab Emirates	0.0	0.0	248.8	2.3
Bahrain	86.7	2.4	243.5	2.3
Tajikistan	-[a]	-	174.6	1.6
Ghana	114.0	3.2	148.1	1.4
Indonesia	0.0	0.0	142.7	1.3
Egypt	0.0	0.0	102.0	1.0
Former Yugoslavia[b]	47.6	1.3	65.2	0.6
Suriname	57.8	1.6	28.7	0.3
Countries in Eastern Europe	681.9	19.2	1772.0	16.6
Former USSR/Russian Federation[c]	500.8	14.1	1595.7	14.9
Romania	62.6	1.8	89.5	0.8
Hungary	71.9	2.0	34.0	0.3
World	3550.9	100.0	10705.7	100.0

[a] Included in figures for the former USSR.
[b] 1992/1994 figures include exports by all the republics of former Yugoslavia.
[c] 1972/1974 figures refer to the former USSR, 1992/1994 figures to the Russian Federation.

Table 6. World imports of unwrought aluminium by major groups of countries, 1972-1974 and 1992-1994
Average, quantity in thousand tons and share in per cent

Group of countries/country	1972/1974		1992/1994	
	Quantity	Share	Quantity	Share
Developed market economy countries	2593.7	75.4	8603.1	77.8
EU12	1683.5	49.0	3427.8	31.0
Japan	426.4	12.4	2595.0	23.5
United States	503.7	14.7	1842.9	12.9
Austria	16.2	0.5	226.1	2.0
Norway	32.0	0.9	135.6	1.2
Switzerland	32.0	0.9	107.8	1.0
Sweden	43.5	1.3	90.7	0.8
Developing countries and territories	447.8	13.0	2239.6	20.2
Republic of Korea	7.6	0.2	564.8	5.1
Taiwan province of China	n.a.	n.a.	397.1	3.6
China	48.0	1.4	188.0	1.7
Thailand	19.5	0.6	171.5	1.6
Hong Kong	20.1	0.6	134.3	1.2
Mexico	14.1	0.4	121.9	1.1
Singapore	2.6	0.1	105.5	1.0
Turkey	40.8	1.2	90.0	0.8
Former Yugoslavia[a]	50.3	1.5	40.7	0.4
Countries in Eastern Europe	394.9	11.5	216.6	2.0
Hungary	100.4	2.9	108.7	1.0
Former Czechoslovakia[b]	107.7	3.1	59.6	0.5
Poland	44.6	1.3	35.7	0.3
Germany, Democratic Republic	118.3	3.4	-	-
World	3438.3	100.0	11059.3	100.0

[a] 1992/1994 figures include imports by all the republics of former Yugoslavia.
[b] 1992/1994 figures refer to the Czech Republic only.

Table 7. Exports and imports of semifabricates of aluminium 1992/1994
Value in millions of dollars

Group of countries/country	Exports		Imports	
	Value	Share (%)	Value	Share (%)
Developed market economy countries	13109.5	87.4	10722.1	72.1
EU12	7760.4	51.7	6871.8	46.2
United States	1888.8	12.6	1228.3	8.3
Japan	764.6	5.1	230.3	1.6
Canada	601.6	4.0	854.4	5.8
Switzerland	564.5	3.8	336.8	2.3
Austria	465.6	3.1	339.8	2.3
Norway	359.1	2.4	104.3	0.7
Sweden	275.6	1.8	300.5	2.0
Australia	220.7	1.5	123.3	0.8
Developing countries and territories	1504.4	10.0	3772.6	25.4
Bahrain	186.7	1.2	5.0	0.0
Egypt	155.5	1.0	17.8	0.1
Republic of Korea	146.7	1.0	408.1	2.8
Taiwan province of China	106.3	0.7	412.3	2.8
Malaysia	65.4	0.4	163.8	1.1
China	63.2	0.4	345.0	2.3
Hong Kong	59.3	0.4	262.0	1.8
Singapore	56.1	0.4	241.8	1.6
Mexico	19.5	0.1	358.5	2.4
Saudi Arabia	4.6	0.0	214.7	1.4
Countries in Eastern Europe	393.3	2.6	366.6	2.5
World	**15007.2**	**100.0**	**14861.3**	**100.0**

Table 8. Tariffs on unwrought aluminium and tariff escalation from alumina to unwrought aluminium for countries producing primary aluminium, 1991/1992

Country or territory	Tariffs on unwrought aluminium, per cent[a]						Tariff escalation (per cent[b])	
	Unwrought HS 7601		Waste and scrap HS 7602		Powders HS 7603			
	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP
Argentina	7.5[c]	-[d]	5	-[e]	7.5-10		2.5	
Australia	0		0		10	5[f]	0	0
Austria	8	4[g]	0		8	4[g]	8	4[g]
Brazil	0[h]	-[d]	0	-[e]	0		0	
Canada	0-10.3	0-6.5[i]	0		9.2-10.3	0-6.5[j]	0	0
China	9		9		18		-11	
Czech Republic	0		0		5.5-5.6	1.37-1.4		
European Union	6	6[k]	0-3.2	0-3.2[k]	5.3-6.3	0[k]	0.5	6
Finland	0		0		0			
Hong Kong	0		0		0			
Hungary	0-10.4	0-10.4[l]	10.4	10.4[l]	9.8	9.8[l]	0	0
India	60		45		60		-5	
Indonesia	0-5		0		0-5		-5	
Japan	1	0	0		4.6	0	1	0
Malaysia	2		2		3			
Mexico	10		0-10		10		10	
New Zealand	0-7	0	0		0		0-7	0
Norway	0		0		0		0	
Philippines	3		3		10			
Poland	0		0		10	7[g]	-10	-7[g]
Republic of Korea	5		2		11		4	
Russian Federation	5		5		5		0	
Singapore	0		0		0			
South Africa	0-20	-[m]	0		0-15	-[m]	20	
Sweden	0		0		0-3.8	0	0	0
Switzerland	4.4-6.8[n]	0[o]	9.4[p]	0[o]	2.1-3.7[q]	0[o]	6.5	0
Taiwan province of China	0-1.5		0		3			
Thailand	6		6		25			
United States	0-2.6	0-2.6[r]	0		3.9-5.7	0[r]	0	0
Venezuela	5		5		5		0	

Sources: TRAINS, various trade journals.

a) Range of tariff rates within group

b) Rate for unwrought aluminium minus rate for alumina. Figures are shown only for countries producing primary aluminium. For unwrought aluminium, the tariff for the main product item imported is used; for alumina, the tariff for aluminium oxide (281820).

c) Changed to 6 per cent from 1 April 1995 (new common external tariff for the Mercosur).

d) From 1 April 1995, preferential rate for Mercosur members 0.

e) From 1 April 1995, preferential rate for Mercosur members 2 per cent.

f) Preferential rate for Pacific Forum countries, Papua New Guinea and New Zealand 0.

g) 0 for LDCs.

h) Changed to 5 per cent 1 January 1994, changed again to 6 per cent from 1 April 1995 (new common external tariff for the Mercosur).

i) GSP rate 6.5 per cent for "other unwrought" (not billets, blocks, ingots, notched bars, pigs, slabs, wire bars or granules cut from ingots), preferential rates for the Caribbean and the United States 0 for all products.

j) GSP rate 6.5 per cent for flakes, preferential rates for the Caribbean and the United States 0 for all products.

k) Preferential rates for ACP and EFTA countries 0.

l) 0 for LDCs and Finland

m) Preferential rate for Turkey 3 per cent, for Malawi 0.

n) Or 2.20-2.30 CHF/ton, whichever is highest.

o) Preferential rates for EU and EFTA 0.

p) Or 2.20 CHF/ton, whichever is highest.

q) Or 4.50 CHF/ton, whichever is highest

r) Preferential rates for Caribbean, Canada, Israel and ANDEAN 0.

Table 9. Tariffs on semifabricates of aluminium, 1991/1992

Country or territory	Tariffs, per cent[a]											
	Bars, rods and profiles HS 7604		Wire HS 7605		Plate, sheet or strip HS 7606		Foil HS 7607		Tubes and pipes HS 7608		Tube and pipe fittings HS 7609	
	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP
Argentina	10[b]	-[c]	12.5[b]	-[c]	12.5[d]	-[c]	12.5[d]	-[c]	14	-[c]	14	-[c]
Australia	10	5[e]	10	5[e]	10	5[e]	15	10[e]	9	5[e]	14	10[e]
Austria	11-12.5	5.5-6.2[f]	11	5.5[f]	11-12.5	5.5-6.2[f]	7-11	3.5-5.5[f]	n.a.	n.a.	n.a.	n.a.
Brazil	0-10[b]	-[c]	10[b]	-[c]	0-10[b]	-[c]	10[d]	-[c]	11	-[c]	14	-[c]
Canada	2.1-10.3	0-6.5[g]	2.1-10.2	0-6.5[h]	0-10.3	0-6.5[i]	0-12.2	0-8[i]	6.5-8	0[h]	10	6.5[h]
China	18		12		20-40		23		20		20	
Czech Republic	4.8-5	1.2-1.25	5-9.8	1.25-2.45	4-5	1-1.25	8.3	2.07	4.8	1.2-3.5[f]	3.8	0.9-2.5[f]
European Union	10	0[j]	10	0[j]	10	0[j]	10	0[j]	0-10	0	7	0
Finland	1.4	0	1.4	0	1.7	0	6.2	0	n.a.	n.a.	n.a.	n.a.
Hong Kong	0		0		0		0		0		0	
Hungary	10.4	10.4[k]	10.4	10.4[k]	10.4	10.4[k]	9.8	9.8[k]	10.4	10.4[k]	10.4	10.4[k]
India	60		60		60-65		60		60		60	
Indonesia	10-30		20		5-30		5-30		10		10	
Japan	9.2-10.2[af]	0	9.2-10.2[ag]	0	0-3	0	10.2	0	10.2	0	4.6	0
Malaysia	25		35		30		30		25		5	
Mexico	10-15		10-15		0-15		10-15		10-15		10-15	
New Zealand	14-15	11-13[f]	14	11.5[f]	14-15	11.5-13[f]	14	12[f]	15	13[f]	0	
Norway	5.8	0[l]	0		0-9	0[l]	1	0[l]	5.6	-[l]	6	-[l]
Philippines	20		10		20		20		20		20	
Poland	10	7[f]	10	7[f]	10	7[f]	10	7[f]	15	10.5[f]	15	10.5[f]
Republic of Korea	11		11		11		11		8		8	
Russian Federation	5		5		5		5		5		5	
Singapore	0		0		0		0		0		0	
South Africa	0-30	0-30[m]	0-25	0-25[m]	0-25	0-25[m]	0-25	0-25[m]	25	0-25[m]	5-10	0-10[m]

Sweden	2.5	0	2.5	0	2.5	0	2.5	0	n.a.	n.a.	n.a.	n.a.
Switzerland	3.7-4.8[n]	0[l]	2.4-8[o]	0[l]	2.1-4.5[p]	0[l]	4.1-12.6[q]	0[l]	2.9-6.8	0[l]	1.8	0[l]
Taiwan province of China	10		0-7.5		12.5		0-12.5		6-7		8.5	
Thailand	30		30		35		35		13		17	
United States	1.5-5	0[r]	2.6-4.2	0[r]	2.7-6.5	0[s]	0-5.8	0[t]	5.7	0[r]	5.7	0[r]
Venezuela	10		10		5-10		10		15		15	

Sources: TRAINS, various trade journals.

a) Range of tariff rates within group

b) Changed to 12-14 per cent from 1 April 1995 (new common external tariff for the Mercosur).

c) From 1 April 1995, preferential rate for Mercosur members 0.

d) Changed to 12 per cent from 1 April 1995 (new common external tariff for the Mercosur).

e) Preferential rate for Pacific Forum countries, Papua New Guinea and New Zealand 0.

f) 0 for LDCs.

g) 0 for Caribbean, United States and LDCs and 0-10.3 for Commonwealth countries.

h) 0 for Caribbean, United States and LDCs.

i) 0 for Caribbean and LDCs, 0-5.1 for the United States).

j) 0 for ACP and EFTA countries.

k) 0 for LDCs and Finland.

l) 0 for EEC and EFTA countries.

m) 3 for Turkey, 0 for Malawi

n) Or 4.20 CHF/ton, whichever is highest.

o) Or 4.10 CHF/ton, whichever is highest.

p) Or 3.30 CHF/ton, whichever is highest.

q) Or 5.80-7.70 CHF/ton, whichever is highest.

r) 0 for Caribbean, Canada, Israel and ANDEAN countries

s) 0 for Caribbean, Israel and ANDEAN countries, 0-3.2 for Canada.

t) 0 for Caribbean, Israel and ANDEAN countries, 1.5-2.8 for Canada.

Table 10. Tariff escalation from unwrought aluminium to semifabricates of aluminium
Per cent, 1991/1992

Country or territory	Bars, rods and profiles HS 7604		Wire HS 7605		Plate, sheet or strip HS 7606		Foil HS 7607		Tubes and pipes HS 7608		Tube and pipe fittings HS 7609	
	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP
Argentina	2.5		5		5		5		6.5		6.5	
Australia	10	5[a]	10	5[a]	10	5[a]	10	5[a]	9	5[a]	14	10[a]
Austria	3-4.5	1.5-2.2[b]	3	1.5[b]	3-4.5	1.5-2.2[b]	-1-3	-0.5-1.5[b]	n.a.	n.a.	n.a.	n.a.
Brazil	0-10		10		0-10		10		11		14	
Canada	2.1-10.3	0-6.5[c]	2.1-10.2	0-6.5[c]	0-10.3	0-6.5[d]	0-12.2	0-6.5[d]	0-8	0	0-10	0-6.5[d]
China	9		3		11-31		14		11		11	
Czech Republic	4.8-5	1.2-1.25	5-9.8	1.25-2.45	4-5	1-1.25	8.3	2.07	4.8	1.2-3.5[b]	3.8	0.9-2.5[b]
European Union	4	-6[e]	4	-6[e]	4	-6[e]	4	-6[e]	0-4	-6	1	-6
Finland	1.4	0	1.4	0	1.7	0	6.2	0	n.a.	n.a.	n.a.	n.a.
Hong Kong	0		0		0		0		0		0	
Hungary	0-10.4	0-10.4[f]	0-10.4	0-10.4[f]	0-10.4	0-10.4[f]	0-9.8	0-9.8[f]	0-10.4[f]	0-10.4[b]	0-10.4[f]	0-10.4[b]
India	0		0		0-5		0		0		0	
Indonesia	10-30		20		5-30		5-30		5-10		5-10	
Japan	8.2-9.2	0	8.2-9.2	0	-1-2	0	9.2	0	9.2	0	3.6	0
Malaysia	23		33		28		28		23		3	
Mexico	0-5		0-5		-10-5		0-5		0-5		0-5	
New Zealand	14-15	11-13[b]	14	11.5[b]	14-15	11-13[b]	14	12[b]	8-15	6-13[b]	0	
Norway	5.8	0[g]	0		0-9	0[g]	1	0[g]	5.6[g]		6[g]	
Philippines	17		7		17		17		17		17	
Poland	10	7[b]	10	7[b]	10	7[b]	10	7[b]	15	10.5[b]	15	10.5[e]
Republic of Korea	6		6		6		6		3		3	
Russian Federation	0		0		0		0		0		0	
Singapore	0		0		0		0		0		0	
South Africa	0-30	0-30[h]	0-25	0-25[h]	0-25	0-25[h]	0-25	0-25[h]	5-25[h]	5-25	5-10[h]	5-10
Sweden	2.5	0	2.5	0	2.5	0	2.5	0	n.a.	n.a.	n.a.	n.a.
Switzerland	-0.7-0.4	0[g]	-2-3.6	0[g]	-2.3-2.4	0[g]	-0.3-5.8	0[g]	-1.5-0[g]	0	-2.6[g]	0

Taiwan province of China	8.5-10		0-7.5		11-12.5		0-12.5		4.5-7		7-8.5	
Thailand	24		24		29		29		7		2.5	
United States	1.5-5	0[i]	0-4.2	0[i]	0.1-6.5	0[j]	0-5.8	0[k]	3.1-5.7	0[i]	3.1-5.7	0[i]
Venezuela	5		5		0-5		5		10		10	

a) 0 for Pacific Forum countries, Papua New Guinea and New Zealand.

b) 0 for LDCs.

c) 0 for Caribbean, United States and LDCs.

d) 0 for Caribbean and LDCs, 0-5.1 for the United States.

e) 0 for ACP and EFTA countries.

f) 0 for LDCs and Finland.

g) 0 for EEC and EFTA countries

h) 3 for Turkey, 0 for Malawi.

i) 0 for Caribbean, Canada, Israel and ANDEAN countries.

j) 0 for Caribbean, Israel and ANDEAN countries, 1.5-2.8 for Canada.

Table 11A. Uruguay Round concessions (changes in italics)

Country	Tariff rates, per cent											
	Bauxite HS 2606		Alumina HS 2818		Unwrought HS 7601		Waste and scrap HS 7602		Powders HS 7603		Bars, rods and profiles HS 7604	
	Base	UR	Base	UR	Base	UR	Base	UR	Base	UR	Base	UR
Australia	0	0	0	0	0	0	0	0	10	*5*	10	*5*
Canada	0	0	0	0	0-10.3	*0-6.8*	0	0	9.2-10.3	*6.1-6.8*	2.1-10.3	*1.4-6.8*
Czech Republic	0	0	2.7-2.8	2.7-2.8	0	0	0	0	5.5-5.6	*4.4-4.5*	4.8-5	*3.8-4*
European Union	0	0	5.5	*4-5.5*	6	6	0-3.2	*0*	5.3-6.3	*5*	10	*7.5*
Hungary	0	0	7.7	*5.5*	0-10.4	*0-7*	0	0	9.8	*7*	10.4	*7*
India	45	*25*	65	*40*	60	60	45	45	60	60	60	60
Japan	0	0	0-3.9	*0*	1	*0*	0	0	4.6	*0*	9.2-10.2	*7.5*
Norway	0	0	0	0	0	0	0	0	0	0	5.8	*5*
Poland	0	*3*	10	*9*	0	*6*	0	*9*	10	*9*	10	*9*
South Africa	0	0	0-10	*10*	0-20	*5*	0	*5*	0-15	*15*	0-30	*15*
Switzerland	0	0	0.1-0.3	*0*	4.4-6.8	*2.9-3*	9.4	*0*	2,1-3.7	*1.4-2.5*	3.7-4.8	*2.5-3*
Thailand	10	*30*	30	30	6	*6-10*	6	6	25	*20*	30	*20*
United States	0	0	0	0	0-2.6	0-2.6	0	0	3.9-5.7	*3.9-5*	1.5-5	1.5-5

Source: World Trade Organization.

Table 11B. Uruguay Round concessions (changes in italics)

Country	Tariff rates, per cent									
	Wire HS 7605		Plate, sheet or strip HS 7606		Foil HS 7607		Tubes and pipes HS 7608		Tube and pipe fittings HS 7609	
	Base	UR	Base	UR	Base	UR	Base	UR	Base	UR
Australia	10	*5*	10	*5*	15	*5*	15	*5*	15	*5*
Canada	2.1-10.3	*1.4-6.8*	0-10.3	*0-6.8*	0-12.2	*0-8*	8.1	*0-5.4*	10.3	*6.8*
Czech Republic	5-9.8	*4-7.8*	4-5	*3-4*	8.3	*6.6*	4.8	*3.8*	3.8	*2.9*
European Union	10	*7.5*	10	*7.5*	10	*7.5-10*	0-10	*0-7.5*	7	7
Hungary	10.4	*7*	10.4	*7*	9.8	*5*	10.4	*7*	10.4	*7*
India	60	60	60-65	60-65	60	60	60	60	60	60
Japan	9.2-10.2	*7.5*	0-3	*0-2*	10.2	*7.5*	12.8	*7.5*	5.8	*3*
Norway	0	0	0-9	*0-7.5*	1	*0.77*	5.8	*5*	6.2	*5*
Poland	10	*9*	10	*9*	10	*9-10*	15	*9*	15	*9*
South Africa	0-25	*15*	0-25	*15*	0-25	*15*	0-25	*15*	5-10	*15*
Switzerland	2.5-8	*1.6-5*	2.1-4.5	*1.4-2.9*	4.1-12.6	*2.7-3.7*	2.9-6.8	*2.8-4.3*	1.8	*1.2*
Thailand	30	*20*	35	*20*	35	*20*				
United States	2.6-4.2	2.6-4.2	2.7-6.5	2.7-6.5	0-5.8	0-5.8	0-5.7	0-5.7	5.7	5.7

Source: World Trade Organization.

Table 12. Consumption of primary aluminium, 1993 and 2000
Thousand metric tons

Group of countries/country or territory	1993		2000	
	Consumption	Share (%)	Consumption	Share (%)
Developed market economy countries	12381.6	67.2	14778.8	58.8
European Union 15	3993.0	21.7	5216.0	20.7
United States	4877.1	26.5	4856.0	19.3
Japan	2174.8	11.8	3055.0	12.2
Canada	492.5	2.7	662.8	2.6
Australia	339.5	1.8	415.7	1.7
Norway	205.7	1.1	212.5	0.8
Switzerland	143.8	0.8	205.6	0.8
South Africa	90.0	0.5	114.1	0.5
Other developed market economy countries	65.2	0.4	40.9	0.2
Developing countries or territories	4548.5	24.7	8131.9	32.3
Africa	137.9	0.8	181.1	0.7
America	782.4	4.3	1082.6	4.3
Brazil	383.7	2.1	507.9	2.0
Venezuela	149.9	0.8	265.3	1.1
Argentina	108.3	0.6	167.1	0.7
Mexico	83.4	0.5	86.7	0.3
Other America	57.1	0.3	55.6	0.2
Asia	3578.1	19.1	6868.2	27.0
China	1318.0	7.5	1806.1	7.2
Korea, Republic	557.1	3.2	1482.6	5.9
India	475.3	2.7	729.0	2.9
Bahrain	124.7	0.7	603.1	2.4
Taiwan province of China	299.1	1.7	567.3	2.3
Indonesia	95.7	0.5	303.8	1.2
Iran, Islamic Republic	116.0	0.7	294.1	1.2
Thailand	147.4	0.8	280.1	1.1
Turkey	128.6	0.7	227.0	0.9
Malaysia	75.0	0.4	156.8	0.6
Singapore	27.5	0.2	72.7	0.3
Hong Kong	45.9	0.3	55.0	0.2
Other Asia	167.8	0.9	221.9	0.9
Europe	50.1	0.3	68.8	0.3

Countries in Eastern Europe	1500.4	8.1	2241.8	8.8
Former USSR	1185.0	6.4	1980.4	7.9
Hungary	140.1	0.8	109.3	0.4
Former Czechoslovakia	62.6	0.3	59.4	0.2
Poland	67.7	0.4	34.8	0.1
Other countries in Eastern Europe	45.0	0.2	57.9	0.2
World	18430.5	100.0	25152.5	100.0

Source: UNCTAD secretariat.