



Evaluation of the Effects of Tariff Hikes on Indian Aluminium Industry

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Abstract

Per capita consumption of aluminium in India is negligible at an average of 1.4 kg as against the global average of 8 kg, while India has the fifth largest bauxite reserves in the world. This paper evaluates the effects of high import tariffs constraining the consumption opportunities of aluminium in India.

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Executive Summary

The implementation of high tariffs on aluminium products, raw materials and imported aluminium scrap in India was aimed at protecting primary aluminium producers from the loss of global competitiveness. The primary aluminium producers have demanded an increase of the export duty on bauxite so that Chinese companies will be discouraged from buying the raw materials at a cheaper rate, which in turn will minimise the export of value-added aluminium products from China to India in the later stages.

This paper argues that high tariffs are privileges granted to the sector to please the powerful primary aluminium producers in India. The real cost of the high tariffs is harming the downstream and value-added manufacturers, who use aluminium as input. It results in low profitability and job losses, which are more harmful to the economy than the issues affecting the primary aluminium industry. The protective measures restrict the availability of recycled aluminium in the country, which needs to be encouraged for leveraging the consumption opportunities of aluminium. The downstream and value-added sectors, hence, have to depend solely on primary aluminium production, which is highly priced and incapable of meeting the rising requirements of many sectors. Thus, in an effort to save the domestic primary aluminium industry that is monopolised by three big firms, the high tariffs result in high prices of aluminium, which erode the competitiveness of the downstream and value-added sectors, consisting mainly of a large number of Small and Medium Enterprises (SMEs). These SMEs contribute more to the economy in terms of income and employment than the primary aluminium sector.

The study demands the removal of the customs duty on primary aluminium products and other aluminium products, import duties on aluminium scrap and raw materials, and export duty on bauxite. The removal of these tariffs will help in leveraging the consumption opportunities of aluminium in India, given the significantly increasing demand for the metal, and the growth of the economy through the development of value-added sectors. These will increase the availability of aluminium, which has to be moulded into alloys that can find applications in diverse sectors.

Evaluation of the Effects of Tariff Hikes on Indian Aluminium Industry

1. Introduction

Aluminium is the third most important base metal in the world in terms of global sales, after iron ore and copperⁱ. The aluminium industry plays a significant role in the global economy through providing direct and indirect employment to many peopleⁱⁱ. There has been considerable growth in the global demand for aluminium in the last 50 years with a compound annual growth rate (CAGR) of 4.5 percent as against CAGR ranging from 2.6 percent to 2.9 percent for other metalsⁱⁱⁱ. Moreover, the price competence of aluminium compared with other metals has increased significantly in the last 20 years, thus finding new applications in different sectors globally^{iv}. One significant aspect of aluminium production is the secondary aluminium production process by recycling aluminium scrap into reusable aluminium. The energy cost required for primary aluminium production is exorbitant, while the secondary aluminium production process is 92 percent more energy efficient than primary production^v. Consequently, advanced countries like the US rely more on recycling and in turn have less influence over primary aluminium prices. China is the world's largest producer and consumer of primary aluminium. China accounts for 55 percent of global primary aluminium production and around 54.4 percent of world's consumption of primary aluminium output^{vi}.

The Chinese government policies in the form of subsidising aluminium smelters through various incentive mechanisms resulted in the expansion of the country's aluminium production capacity from 11 per cent in 2000 to 54.4 per cent in 2015^{vii}. As a result, there has been a significant rise in aluminium imports of about 181 percent in the period 2012-2015 from China to the rest of the world. Other major aluminium producing nations, like the US, Canada and Brazil, cut down production and capacity, due to the decline in global aluminium prices^{viii}. Subsequently, many other countries imposed protective measures like import restrictions on Chinese aluminium products for saving the domestic producers of aluminium. These restrictions are adversely affecting the downstream and value-added sectors^{ix}, which is more harmful to the economies than the losses caused by Chinese imports to powerful primary producers^x.

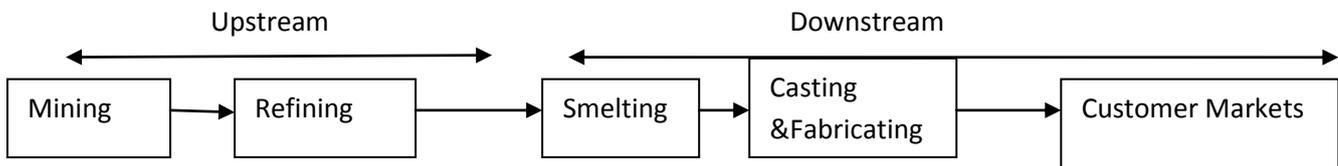
India was the world's seventh largest producer of aluminium after China, Russia, Canada, US, Australia and UAE in 2014-15, with fifth position in bauxite reserves in the world, and the third largest aluminium consumer after China and US^{xi}. Though the bauxite reserves in India constitute 7.6 percent of the world's deposits, India's primary aluminium production is only 3percent of the global production. Moreover, per capita consumption of aluminium in India was very low at 1.4 kg, as against the world average of 8 kg in 2014^{xii}. Aluminium in India is utilised in only 300 applications compared with over 3000 in developed countries, showing the need for leveraging the consumption opportunities of aluminium in the country^{xiii}. All the primary aluminium producers in India suffered loss of global competitiveness and went for production cuts from 2014, due to the relatively high prices here compared with the declining global prices. This has resulted in job cuts by all primary aluminium production firms in the country, as part of cost rationalisation^{xiv}.

In the Union Budget 2016-17, the customs duty on primary aluminium products was increased from 5 percent to 7.5 per cent, while that on other aluminium products were increased from 7.5 percent to 10 percent. This was due to the demand by the primary aluminium producers for saving the primary aluminium industry, given the significant growth in Chinese aluminium exports. The high import duties of 5 percent and 7.5 percent on raw materials like coal tar pitch and aluminium fluoride respectively increase the price of raw materials. The aluminium scrap has an import duty of 2.5 per cent in India compared with zero import duty in competing nations. The primary aluminium producers are demanding that the import duty on aluminium scrap be on a par with other aluminium products. They are also insisting on increasing the export duty on bauxite from 20 per cent to 50 per cent to discourage China and others from buying it cheap from India and then selling back the value-added materials^{xv}.

In this background, this paper elucidates that the restrictions on the free trade of aluminium through various protective measures like high import tariffs on raw materials and aluminium products, and high export duties on bauxite will prevent leveraging the consumption opportunities of aluminium, given the rapid growth of sectors that require aluminium as input. This study also shows how such restrictions discourage competition among aluminium consuming sectors.

2. Value Chain and Stakeholders of Aluminium Industry

The following flowchart shows the value chain of the aluminium industry in India.



There are four major steps involved in the aluminium production process - bauxite mining, alumina refining, alumina smelting and manufacturing value-added products. The mining and refining activities, which constitute the first and second stages, are classified as upstream activities. Downstream activities, which constitute the third and fourth stages, comprise the processing of aluminium after it is tapped from the electrolysis cell. The activities include smelting, casting and fabricating. The downstream products include rods, sheets, extrusions and foils.

In the first stage, bauxite, which is the only ore for the commercial production of aluminium, is mined, crushed and beneficiated in preparation for the refining process. In the second stage, the mined bauxite is processed into alumina at refineries using the Bayer process. The main decision-making bodies involved in both these stages are the Ministry of Mines, Ministry of Environment and Forests, Ministry of Tribal Affairs, Ministry of Rural Development and State Governments concerned.

In the third stage, alumina is smelted to produce aluminium through electrolysis. The smelting process is energy intensive, where carbon/coal and power are the main components along with alumina. Three major Indian players are involved in the production of primary aluminium, the product of this process. They are National Aluminium Company (NALCO) with a market share of 21 per cent, Hindustan Aluminium Company (Hindalco) with a market share of 39 per cent and the Vedanta Group, which owns Madras Aluminium Company Limited (MALCO) and Bharat Aluminium Company (BALCO), with a market share of 40 per cent. NALCO is in the public sector, whereas, Hindalco and Vedanta are private sector companies. All three firms are integrated manufacturers with facilities for bauxite mining, alumina extraction from bauxite and smelting for producing aluminium. However, they do not have their own coalmines and depend on Coal India for the supply of coal.

Apart from primary aluminium smelters, there are smelters that process new scrap, which is the waste material from aluminium fabrication and aluminium scrap, for producing secondary aluminium. Secondary aluminium accounts for about 40 per cent of aluminium consumption in the country. There are 1000 players in the unorganised secondary aluminium sector, consisting of SMEs spread across Gujarat, West Bengal, Maharashtra and Tamil Nadu. The only recycling unit in the organised sector belongs to Hindalco at Taloja with 25000 tonnes annual capacity. This plant was facing challenges due to shortage of aluminium scrap, but now it has improved its capacity to 80 percent from the previous 60 percent. The group subsidiaries of Hindalco are the sole consumers of the aluminium scrap generated at its recycling unit, while around 0.6 million tonnes of secondary aluminium are produced through imported scrap from China, followed by the US and the UK^{xvi}. The Ministry of Coal and Ministry of Mines are the implementing agencies involved in the policy decisions associated with the third stage, namely the smelting of alumina and recycling of aluminium scrap.

In the fourth stage, primary aluminium is either converted into pig ingots and wire rods or cast into slabs for further processing into semi-finished products like forgings, pigment & powder, rod & bar and sheets & plates. All the three major aluminium companies have facilities for processing aluminium into downstream products. The domestic foundry and extrusion sectors mainly use recycled secondary aluminium for the production of different aluminium products in the fourth stage. The policy implementing agencies involved in the fourth stage are the Ministry of Commerce, Ministry of Mines and Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) in Nagpur under the aegis of the Ministry of Mines.

The final component in the value chain of aluminium is the customer market. The main primary aluminium consuming sectors, as of 2014, include electrical sector (48 per cent), transport sector (15 per cent), construction (13 per cent), consumer durables (7 per cent), machinery & equipment (7 per cent), packaging (4 per cent) and others (6 per cent)^{xvii}. The consumption of secondary aluminium is confined mainly to the utensils and casting industry.

The Aluminium Association of India (AAI)^{xviii}, Metal Recycling Association of India (MRAI), Federation of All India Aluminium Utensils Manufacturers, Aluminium Casters Association of India etc^{xix} are the other stakeholders in the aluminium industry.

3. Aluminium Policies, Production and Consumption in India

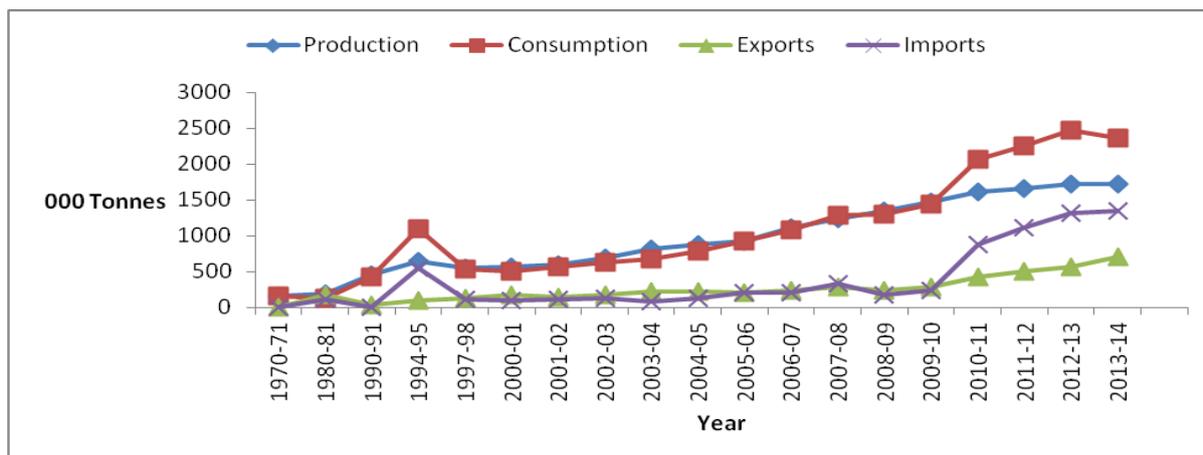
The aluminium industry was regulated in India until 1989 with the promulgation of the Aluminium Control Order, 1970, though there was informal control prior to the ratification of the order. It imposed price and distribution controls as well as entry barriers on the sector. The order required each producer to produce 50 per cent of the company's total metal production as electrical conductor (EC) grade in the shape of ingots and wire rods, for supply to units against allotments made by the Controller of Aluminium, who was responsible for fixing the price of the metal in the domestic market. The objective of the government was to ensure adequate availability of EC grade metal for the manufacture of cables and conductors needed for rural electrification programme.

Figure 1 shows the slow growth in the production and consumption of aluminium in India during the highly controlled policy regime compared with the post-liberalisation era. There was a steep increase in the customs duty on the import of aluminium ingots^{xx} from August 1976 to March 1985 in the range of 20 percent to 40 percent advalorem^{xxi} in India, as part of the protective measures adopted by the government.

Slow growth rate along with the resentment of the primary aluminium producers and the commissioning of the NALCO plant in 1988 resulted in the withdrawal of the Aluminium Control Order, 1970, on March 1, 1989. Changes in the global market prices against the administered prices in the domestic market led to frequent changes in the customs duty after April 1985. The free import of aluminium was permitted in India under the Open General License (OGL) Scheme^{xxii} in 1988 to facilitate better availability of the metal in the country. During the Export Import (EXIM) policies^{xxiii} of the 70s and 80s, freely imported/exported items were monitored based on the licence issued under OGL.

In 1991, as part of the new economic liberalisation policies, the aluminium industry was delicensed with the abolition of controls on foreign investments and imports. With the introduction of the liberalisation policy, the government abolished the post of the Controller of Aluminium.

Figure 1: Production, Consumption, Imports and Exports of Aluminium in India (000 tonnes)

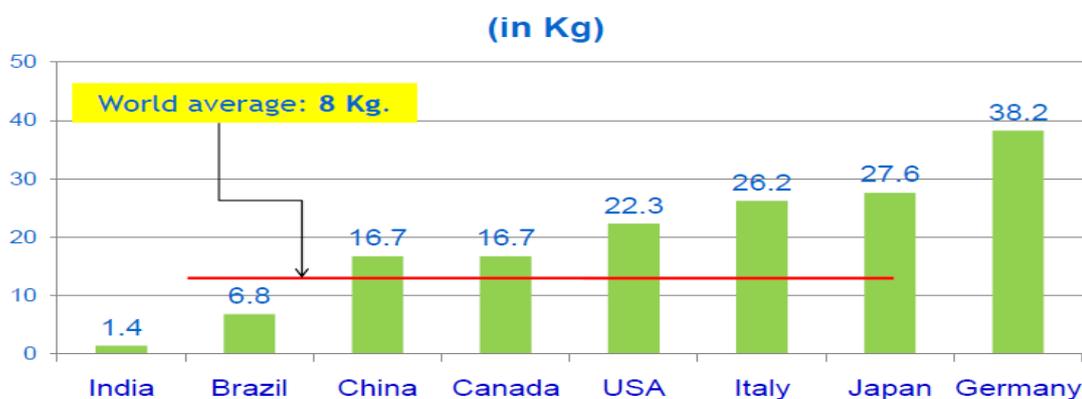


Note: Consumption= (Production + Imports) - Exports

Source: DGCIS 2016, Indian Minerals Year Book, various issues^{xxiv}

The production of aluminium increased from 167 thousand tonnes in 1970-71 to 1723 thousand tonnes in 2013-14, while aluminium consumption increased from 161 thousand tonnes to 2363.7 thousand tonnes in the same period. Due to the progressive reduction in import tariffs, the import of aluminium increased significantly from 12.6 thousand tonnes in 1990-91 to 1348 thousand tonnes in 2013-14. The export of aluminium increased from 12.3 thousand tonnes to 707.3 thousand tonnes in the same period, due to the liberalised policies. The country's share in global aluminium consumption also increased from 3 per cent in 2008-09 to 7 per cent in 2014-15^{xxv}. Though there has been a significant rise in aluminium consumption over the years, the per capita consumption for aluminium is only 1.4kg, which is among the lowest in the world, as shown in Figure 2.

Figure 2: Per Capita Consumption of Aluminium in India and Other Major Aluminium Producing Nations



Source: NALCO (2014)^{xxvi}

In India, the electrical sector is the biggest end user of primary aluminium, due to the Aluminium Control Order, 1970, that stipulated the requirement of 50 per cent of aluminium production to be electrical grade^{xxvii}. The order also fixed the retention prices of this grade of aluminium. On the other hand, transportation is the main end user of primary aluminium globally, with the sector accounting for the consumption of 43 per cent of the metal in Japan and 35 per cent of the metal in North America and West Europe^{xxviii}. While the construction industry accounts for 18 per cent of the metal consumption in the US and 25 per cent of that in Japan, the industry makes up barely 13 per cent of the metal consumption in India. These data show that despite having the fifth highest bauxite reserves in the world, India is not leveraging the consumption opportunities of aluminium in the country. This is evident from the poor per capita consumption of aluminium and skewed consumption in particular sectors.

The major growth in aluminium consumption is expected to come from the downstream sectors through both primary and secondary aluminium production. Though secondary aluminium constituted 40 per cent of the aluminium consumption in India in 2015, the aluminium scrap recycling rate is only 25 per cent, which is among the lowest in the world, as compared to 90 per cent in the US^{xxix}. Through one tonne of recycled aluminium, around 8 tonnes of bauxite, 14000 kWh of energy, 6300 litres of oil, 238 million Btu's of energy and 7.6 cubic metres of landfill can be saved, according to studies^{xxx}. The recycling units in India are unorganised and utilise outdated technology compared with those in the competing countries like the US, France, Germany, Italy and the UK, due to the absence of industry status to the recycling sector^{xxxi}. By offering industry status to the sector, companies operating in the sector can easily get financial assistance and tax concessions, which will lead to greater involvement from the private sector. Granting industry status could lend acknowledgement to the sector's potential.

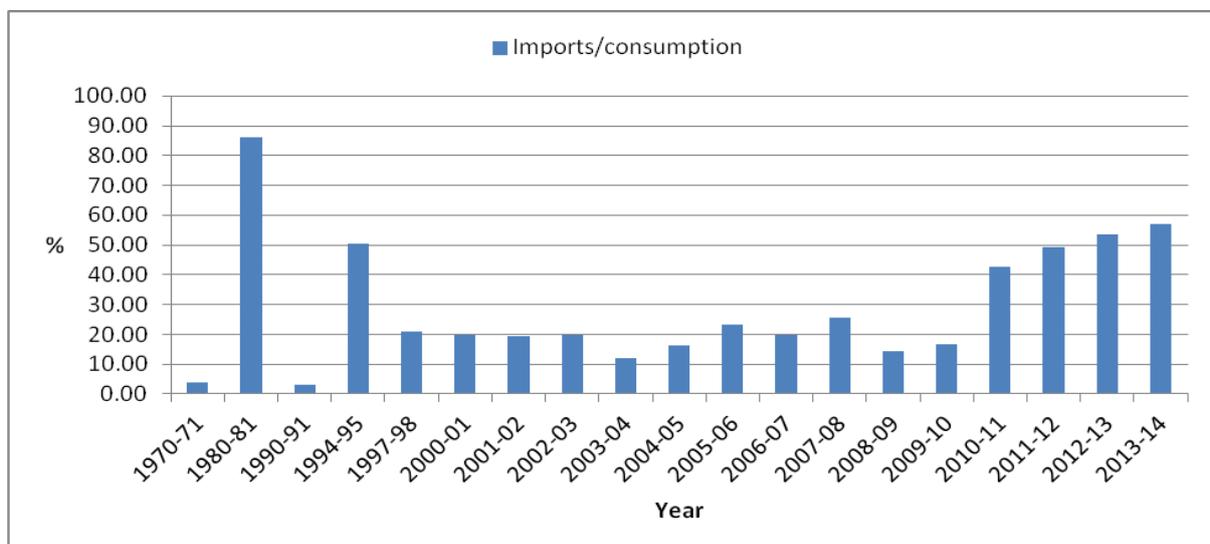
Aluminium has industrial and economic significance for India, as the country has abundant raw material to produce this metal. India's aluminium requirement is projected at 8 million tonnes by 2025, up from 3.2 million tonnes in 2015. This level could be even higher, if the country's potential is fully unlocked.

4. Implications for High Tariffs

The customs duty on primary aluminium imports was 25 percent until the early 1990s to promote NALCO so that the secondary producers would not import aluminium and thus buy it at the rate sold by NALCO^{xxxii}. It was reduced to 10 per cent in 1994 and was progressively increased to 33.4 per cent in 1999. This was again reduced to 15 per cent in 2003-04 and further to 10 per cent in the Union Budget 2005-06. The tariff came down to 5 percent in 2008. The government raised the import duty on primary aluminium by 2.5 percentage points in 2016 to 7.5%.

Import duties on downstream industries were reduced to 7.5 percent, as part of the liberalised policy regime. The import of aluminium scrap was unregulated in 2000, while since 2013, an import duty of 2.5 percent was imposed on aluminium scrap. The government did not justify the hike and merely stated it as a move for public interest^{xxxiii}. Aluminium scrap is mainly used by small and medium industries, which are completely dependent on imported scrap for recycling.

Figure 3: Share of Imports in Aluminium Consumption in India



Source: Calculations based on statistics in Indian Minerals Year Book, various issues^{xxxiv}

The share of imports in total aluminium consumption in India increased from 3.7 per cent in 1970-71 to 86.22 per cent in 1980-81, due to the price and distribution controls until 1989. The share declined to 2.94 per cent in 1990-91, due to the withdrawal of the Aluminium Control Order, 1970, in 1989 and the high growth recorded in the domestic aluminium sector. There was significant rise in the share of imports in aluminium consumption in the liberalised regime, due to the progressive reduction of import duties.

The share rose to 42.48 per cent in 2010-11 and 57 per cent in 2013-14. Majority (about 17.6 per cent) of the imports came from China, followed by UAE (13.9 per cent) in 2013-14^{xxxv}. Aluminium imports from China grew at a CAGR of 35 per cent in the last five years.

The customs duty on primary aluminium products and downstream industries was increased to 7.5 per cent and 10 per cent, respectively, in the Union Budget 2016-17. This is aimed at reducing aluminium imports for protecting the interests of primary aluminium producers. Since China is dependent on bauxite imports for aluminium production, irrespective of the grade of the bauxite exports, the lower-grade bauxite, not used by the domestic aluminium manufacturers, is exported to China, making up around 14 per cent of China's import requirements^{xxxvi}. The primary aluminium producers hence demand a ban on bauxite exports to China or an increase of the export duty on bauxite from 20 per cent to 50 per cent to discourage China and others from buying it cheap from India and then selling back value-added materials, so that local producers are not adversely affected.

The next sections discuss the implications of increasing the tariffs for the primary aluminium producers, recycling sector, downstream and value-added sectors.

4.1 Primary Aluminium Producers

4.1.1 Indian Aluminium Prices

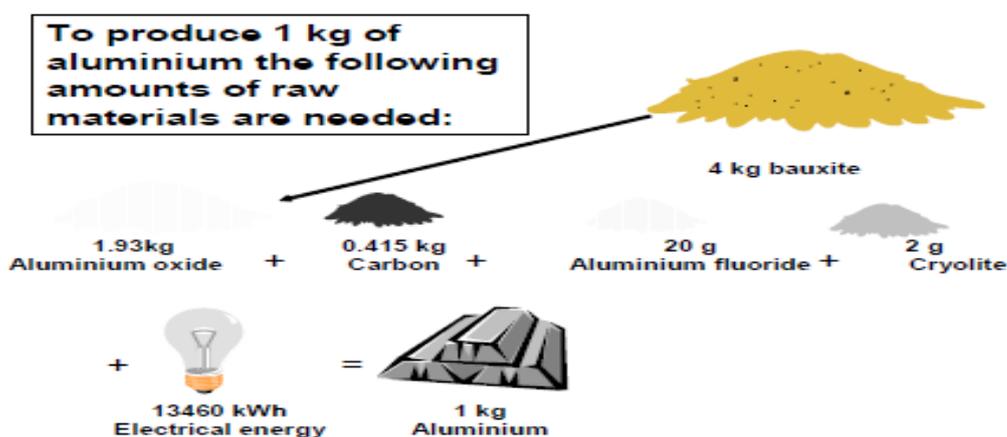
Indian manufacturers had been the low-cost producers of the base metal for a long time, due to access to captive power^{xxxvii}, availability of cheap labour and proximity to abundant supply of bauxite. The Indian aluminium prices were, thus, lower than the global aluminium prices represented by the London Metal Exchange (LME) prices in most years, resulting in making the industry globally competitive.

Since 2014, the Indian primary aluminium manufacturers were forced to increase their prices due to the high cost of production, compared with manufacturers in other countries. The cost of production of aluminium in India was \$1500 per tonne compared with the global average of \$2173 per tonne in 2010. In June 2015, the average production cost was approximately \$1800 per tonne in India, compared with the global average of around \$1665 per tonne^{xxxviii}.

The input costs for primary aluminium production in India have been increasing significantly since 2014, mainly due to government interventions. Despite an abundant supply of bauxite resources, the constraints on bauxite mining like the difficulties in obtaining environmental clearance for bauxite mining, the consequent dominance of existing players over the bauxite mines, the entry barriers for new players to the field and

land acquisition issues constraining setting up of mines have resulted in the increasing bauxite costs. The costs associated with coal have also increased since 2014, due to various reasons. The Supreme Court had quashed the coal block allocations to private companies, including Vedanta Ltd and Hindalco Industries Ltd, on September 24, 2014. Following this, coal became an auctioned resource, as part of the Mines and Minerals Development and Regulation Amendment Act, 2015. The auctioned route together with the new levy to be paid by the leaseholders to the District Mineral Foundation at an amount not more than one third of the royalty prescribed by the Central Government, has resulted in increasing the coal and bauxite costs. Besides, coal linkages allotted to aluminium manufacturers will expire by 2018, which will raise costs further, as firms bid to retain their raw material linkages. The rise in the clean energy cess on coal in the Union Budget 2016-17 will also increase the coal costs.

Figure 4: Raw Materials for Producing 1 kg of Aluminium



Source: Balco^{xxxix}

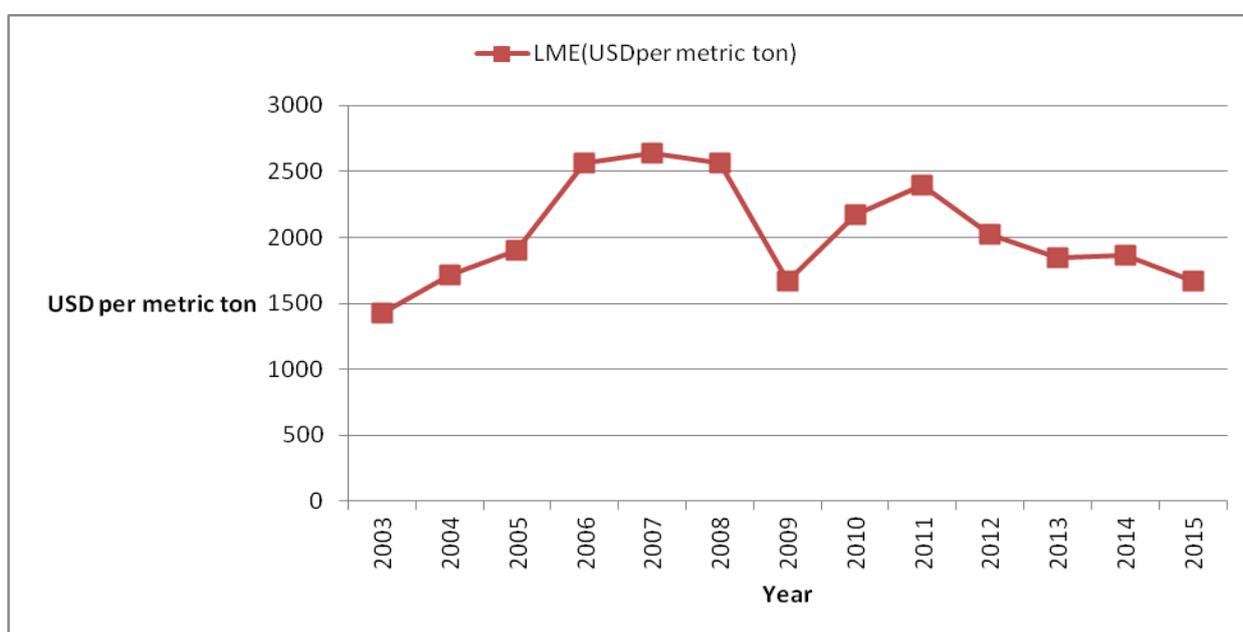
There are import duties on the raw materials like coal tar pitch and aluminium fluoride used in the electrolysis process of the aluminium smelting process in the range of at 5 per cent and 7.5 per cent, respectively, Since these raw materials contribute to 4 per cent and 1.5 per cent of total aluminium cost respectively, the protective measures namely high import duties on these raw materials also contribute to high input costs.

The aluminium prices in India depend on the demand for aluminium and the cost of production. These factors mainly depend on the growth in the end use segments like power, consumer durables, automobiles, packaging etc, and the overall growth in the economy. Due to the consistent growth rate of the Indian economy at 8 per cent and the high growth recorded in these sectors, the demand for aluminium has been stable.

4.1.2 Global Aluminium Prices

The global primary aluminium prices, represented by LME Prices came down by 35 per cent to \$1665 per tonne in June 2015 from a peak of \$2401 per tonne in June 2011. The reasons for this decline include a drop in production costs, mainly input costs due to lower oil, alumina and electricity prices, as well as lower labour costs globally, created by the implementation of new and cheaper technologies with lower electricity consumption and higher efficiency. Slow world growth, devaluation of currencies in many countries, creation of huge capacity in the Chinese aluminium industry and strengthening of dollar against other currencies contributed to the decline in the production costs^{xl}.

Figure 5: London Metal Exchange Prices



Source: World Bank, Investing.com

4.1.3 Loss of Global Competitiveness of Indian Primary Aluminium Producers

Considering the above factors, the rising input costs in India compared with those in other countries, slow world growth and Chinese over capacity are the main factors contributing to the loss of cost competitiveness in the Indian primary aluminium industry. Vedanta's share price fell by 63.01 per cent from 2015 to 2016, while Hindalco Industries lost 54.55 per cent^{xli} in the same period. The capacity utilisation in the primary aluminium industry, which was around 100 per cent in 2013-14, has declined to 50 per cent since 2014^{xlii}. All the top primary aluminium producers started cutting jobs, as part of cost reduction measures.

Through increasing the import duty on aluminium products and export duty on bauxite, the primary aluminium manufacturers will be able to sell more aluminium to the downstream sectors at higher prices, which can increase the profitability of the primary aluminium industry in the short run. The protectionist measures adopted by the Government, however, will not cause any significant rise in the cost competitiveness in the medium to long term. The reason is that the increasing input costs, which depend on the government interventions, will offset the profitability. Rise in the import duty on raw materials like coal tar pitch and aluminium fluoride will increase the input costs.

4.2 Aluminium Recycling, Downstream and Value-added Sectors

As recommended by the report of the Working Group for XII Five Year Plan (2012-17) on Non-ferrous Metals set up by the Ministry of Mines, Government of India, aluminium scrap recycling needs to be promoted in the country for leveraging the consumption opportunities of aluminium^{xliii}. India has no viable domestic aluminium scrap market, because of lack of concerted effort to utilise tons of non-segregated scrap thrown away everyday by industries^{xliv}. Hence, around 0.6 million tonnes of secondary aluminium are produced through captive processing of seconds and scrap imports^{xlv}. There has been a significant rise in the aluminium scrap imports since 1997-98 with a CAGR of around 27 per cent, with aluminium scrap imports constituting around 53.53 per cent of the total aluminium imports at present^{xlvi}.

The tariffs on aluminium scrap lead to an increase in the prices of imported aluminium scrap and other products, which adversely affects the secondary aluminium production. Even though the international price is lower than the domestic price, when the high customs duty is added to it, the margin of difference between the two is negligible. The high customs duty thus constrains the secondary aluminium manufacturers, comprising SMEs spread across Gujarat, West Bengal, Maharashtra and Tamil Nadu, in availing themselves of the lower international price. The aluminium recyclers have no choice but to purchase the metal from the domestic primary producers, thus adversely affecting the competitiveness of the recycling industry. Thus, tariffs on aluminium scrap imports do not help in leveraging the consumption opportunities of aluminium in India and undermine the competitiveness of the downstream sector.

The greatest scope for value addition and employment lies in the development of downstream aluminium end products like castings, extrusions, rolled products, fabrication and finished items through the production of both primary and secondary aluminium. The per capita consumption of aluminium downstream products in India, however, is among

the lowest in the world, due to the high costs owing to the high import duties on aluminium scrap and downstream products^{xlvii}. Free trade of aluminium by reducing the import duties will help enhance competition in the downstream sector worldwide and thus benefit the economy.

The Indian foundry (metal casting) units manufacture critical cast equipment from both ferrous and non-ferrous metal for use in auto rickshaws, railways, heavy machinery, textile, cement, agro, power, oil and natural gas. Since the primary aluminium metal is costlier by \$300-\$350 per tonne, metal alloys are produced through scrap route in order to make the finished products cost effective. Due to the inadequate amount of aluminium scrap generated in India, the Indian foundry industry relies on imported aluminium scrap, which accounts for around 40 per cent of the value of any foundry item, to meet the annual requirements of nearly 10 tonnes of aluminium castings^{xlviii}. A JNARDDC report recommends the need for aluminium scrap and waste imports at nil duty, due to the non-availability of aluminium scrap in the domestic market for producing auto components.^{xlix}. Thus, levying 2.5 per cent import duty on aluminium scrap adversely affects the business in the Indian foundry units and even drives many units out of business. Majority of the foundry units are in the small-scale industry category and provide employment to 5 lakh people directly and 15 lakh people indirectly^l. The metal casting manufacturers in India could suffer a potential revenue loss of \$1.84 billion, due to the imposition of the import duty on metal scrap, according to projections in the period 2013 to 2018^{li}. Reports also show the threat of losing ₹11000 crore of exports business by the Indian foundry units to competing countries like China and Taiwan, where there is nil import duty on metal scrap along with low energy and finance cost^{lii}.

The three firms that monopolise the Indian primary aluminium market -NALCO, Vedanta and Hindalco -provided direct and indirect employment to 7320,55000 and 21976 people, respectively, in 2014-15, that is, only 84296 people^{liii}. The aluminium downstream industry, especially the casting industry, provides direct and indirect employment to 20 lakh people. The main value-added sectors using aluminium as input like power, automobile, utensil and construction industry provide greater employment opportunities than the primary aluminium industry. The automobile industry provides jobs to 130 lakh people, the building and construction sector provides jobs to around 31 million people and the power sector provides jobs to 4 lakh people. Thus, though one of the main arguments for the implementation of high import tariffs is job losses in the primary aluminium sector, the employment opportunities provided by the downstream and value-added sectors are many times higher than that of the primary aluminium industry monopolised by three big

firms. The recycling, downstream and value-added sectors using aluminium as input mainly consist of SMEs, which contribute to about 9 per cent of India's Gross Domestic Product(GDP).The primary aluminium production contributed only 0.17 per cent of India's GDP in 2013-14^{liv}. Reducing the tariffs will help in reducing the prices of the aluminium products, making the recycling, downstream and value-added sectors become globally competitive, resulting in higher real income, thus benefiting the economy.

One among the main growth drivers of the Indian aluminium downstream products is the automotive sector^{lv}. Lightweight aluminium is increasingly becoming the metal of choice for automotive manufacturers globally with the emergence of mandatory fuel efficiency norms made possible through the usage of lightweight metals^{lvi}. While 140 kg aluminium per vehicle is used in Western countries, only 40 kg aluminium is used for similar vehicles in India^{lvii}. The aluminium usage in the Indian automotive sector is restricted to low-volume vehicles like sports cars and heavy trucks. Aluminium content in lightweight vehicles in India is 6 to 8 per cent, whereas it is 11 per cent in China, 24 per cent in North America, 16 per cent in Japan and 29 per cent in the Eurasian Economic Union^{lviii}. Given the rising demand for aluminium globally and its low usage in the Indian automotive sector, there is high growth potential for aluminium in this sector.

Table 1: Comparison of Steel and Aluminium Usage in Vehicles

	Steel weight (kg)	Aluminium weight (kg)	% Weight reduction replacing steel by aluminium (part)	% Weight reduction replacing steel by aluminium (vehicle)	% Cost increase replacing steel by aluminium (part)
Body in white	285	218	23.5	3.90	250
Bonnet	14.8	8.3	44	0.48	300
Door	15.7	9.5	39	0.40	275
IP Beam	11.4	N/A	45	0.33	350

Source: Nayyeri (2015)^{lix}

Table 1 shows weight reduction versus price increase, if steel is replaced by aluminium in vehicles. The high cost of aluminium bodies compared with that of steel and cast irons acts as the main constraint limiting the use of aluminium bodies in the Indian automotive sector, due to the cost consciousness of the Indian market^{lx}. Aluminium production at low cost can increase the usage of the metal in this sector^{lxi}. Cheap aluminium imports thus help in leveraging the opportunity of aluminium usage in this sector, while high tariffs on

imported aluminium downstream products will increase the prices of these products, constraining the usage of aluminium bodies. Reducing the tariffs on imported aluminium downstream products in India will thus result in the emergence of a globally competitive automotive industry that offers high quality, innovative and low-priced vehicles with greater choice for consumers.

4.3. Benefits for Low-income Consumers from Lower Tariffs and a Bigger Aluminium Market

Low-income consumers will gain from low tariffs, since they can pay lower prices for aluminium products. This helps in improving their quality of life, as shown in the cases below.

The aluminium utensil industry, which accounts for around 20 per cent of secondary aluminium consumption in India, consists of more than 4000 small firms. The industry faces direct competition from the stainless steel utensil industry, as stainless steel utensils are available at one fourth of the price of aluminium utensils. The share of aluminium in the utensil sector is declining compared with that of stainless steel, due to the availability of low-cost stainless steel in grades other than 302/304, despite the high advantage of aluminium over stainless steel^{lxii}. The cheap stainless steel utensil sector had a market size of ₹50000 crore in 2014, while that of the aluminium utensil sector was only ₹3200 crore^{lxiii}. The demand for aluminium utensils has also come down, due to the high cost. The reduction in the capacity utilisation of aluminium at only 60 per cent with supply overriding demand indicates the low demand for aluminium^{lxiv}. Despite this, the aluminium utensil industry is projected to grow by 15 to 20 per cent in the next few years. Since aluminium utensils are gaining popularity among all segments of the population, especially the low- and middle-income segments, the high tariffs and the resultant high prices affect considerable segments of the population^{lxv}.

Around 95 per cent of aluminium utensils are made of recycled aluminium, which is completely dependent on imported scrap, due to the inadequate supply of domestic scrap. The increased availability of cheap imported scrap and imported downstream products like aluminium sheets by eliminating the high import tariffs will help reduce the high costs of aluminium utensils, making the industry competitive. The reduction of export duty on bauxite will improve the availability of wider choices of low-priced aluminium utensils for the low- and middle-income consumers in India. Consumer gains will compensate for the losses of domestic producers and their employees due to low tariffs through the aggregate demand effect. This is because though import competition will affect the local primary

aluminium labour market, it can create additional jobs in the industries using aluminium as input, due to the hike in demand for low-cost aluminium products.

Packaging is a major sector that can exploit aluminium consumption and help improve the quality of life of the people. The packaging industry constitutes only 4 per cent of the total aluminium consumption in India. The food and pharmaceutical packaging sectors are the driving force of growth in the packaging industry in India. The large and growing middle class along with the growing organised retail sector in India are fuelling growth in the packaging industry. Per capita packaging consumption in India is, however, paltry at 4.3 kg compared with 42 kg in Germany and 19 kg in Taiwan. Data from the Indian Institute of Packaging (IIP) show that only 2 per cent of India's total processed food is packaged compared with 70 per cent in Western countries. This is important in developing countries like India, since 30 per cent of the food perish due to lack of effective packaging. Thus, exploiting the opportunities in the aluminium packaging market helps in the quality of life improvement of the Indian consumers.

Plastic flexible packaging dominates the Indian packaging industry. However, the limited recycling capacity of plastic, the safety of food products wrapped in plastic and environmental concerns have initiated the need for an alternative material^{lxvi}. Aluminium packaging minimises wastage and provides a resistant barrier to protect food, beverages, pharmaceuticals and cosmetics. Aluminium packaging has one of the best recycling records of any packaging material today. Recycling aluminium can save up to 95 per cent of the energy required to produce primary aluminium. It can also save 97 per cent of the water needed to produce new metal from ore^{lxvii}. The high tariffs on aluminium scrap stifles the aluminium recycling sector and thereby constrains the consumption opportunities of aluminium in the packaging industry in India.

Aluminium cans are gaining wide appeal in India. Beverage majors like Coca Cola have announced the introduction of aluminium bottles in the Indian market in the next three to four years to sell aerated drinks, due to ease of transportation, minimised exposure to sun, longer shelf life and greater freshness. Indian consumers are in favour of the new packaging, given that their increasingly progressive attitude. The aluminium beverage can market is valued at \$2 billion and is logging 21 per cent growth each year. Low-installed capacity has remained a key bottleneck for the penetration of aluminium beverage cans for a considerable time. Aluminium can packaging is still a nascent market in India with very few players in this space. A bigger aluminium packaging market through lower tariffs can thus benefit consumers significantly.

5. Conclusion and Recommendations

The Indian primary aluminium companies want to restrict aluminium imports so that they can sell their produced aluminium to the downstream and value-added firms using aluminium as input and charge them with higher prices. However, SMEs are the major players in the Indian secondary aluminium market. The big players (limited in number in the market) are trying to protect their status quo and make profit at the cost of larger employment opportunities that secondary aluminium industry can generate. The profitability in the primary aluminium industry will not improve significantly until the world aluminium prices are retained and the production costs in India are controlled. The growing demand for downstream and value-added products can actually offset the struggles of the Indian primary aluminium sector, thereby benefiting the economy.

The consequence of high tariffs on imported raw materials is that it restricts the growth of the downstream and value-added manufacturers, which has an overall negative impact on the Indian economy. The protective measures restrict the availability of recycled aluminium in the country. The recycling of aluminium needs to be encouraged for leveraging the consumption opportunities of the metal. The downstream and value-added sectors, hence, have to depend on primary aluminium, which is highly priced and incapable of meeting the rising requirements in many sectors. Thus, in an effort to save the domestic primary aluminium industry dominated by three big firms, the high tariffs result in high prices of aluminium, which erode the competitiveness of the downstream and value-added sectors consisting of a large number of SMEs. The high aluminium prices affect all segments of population, especially the low- and middle-income segments consuming value-added products like aluminium utensils. Through removing import duties on primary aluminium and other aluminium products, import duty on aluminium scrap and export duty on bauxite, the value-added and downstream manufacturers gain access to a wider range of intermediate input at lower prices. This will help the downstream sectors like aluminium castings and the value-added sectors like automotive and utensils to become globally competitive. Since there is a growing end-user demand for aluminium in the country, the imported products can fulfil the requirements. The availability of aluminium at low price makes aluminium more competitive than other materials like steel, glass, copper etc. Through the removal of tariff hikes, the consumers of aluminium products will enjoy the benefits of a wide range of low-priced value-added products. These benefits will compensate for losses to the domestic aluminium producers.

The customs duty on primary aluminium products and other aluminium products should be removed. The import duties on raw materials, namely coal tar pitch and aluminium

fluoride, need to be scrapped for reducing the input costs. The import duty on aluminium scrap needs to be removed as in competing nations like Thailand and China. The export duty on bauxite needs to be removed as it is in the case of removal of export duty on iron ore in the country. The reduction in these tariffs will help in leveraging the consumption opportunities of aluminium in India, given the rising demand for the metal and the thriving economy through the development of value-added sectors. These measures will increase the availability of aluminium in the country.

ⁱ Satpathy B N and S Mohan (2016): Govt of India-Niti Ayog, Metals in World Economy: Case of Aluminium Industry in India: Status and Constraints

ⁱⁱ Das S K and W Yin(2007) : The Worldwide Aluminium Economy: The Current State of the Industry, JOM, November

ⁱⁱⁱ Oswal M (2016): Aluminium: New demand and Chinese costs to drive LME– Detailed Report, <http://www.motilaloswal.com/site/rreports/HTML/635156981872965139/index.htm>

^{iv} Oswal M(2016): Aluminium: New demand and Chinese costs to drive LME– Detailed Report, <http://www.motilaloswal.com/site/rreports/HTML/635156981872965139/index.htm>

^v <http://www.aluminum.org/industries/production/secondary-production>

^{vi} <http://www.adcommission.gov.au/adsystem/referencematerial/Documents/MASTER%20-%20Steel%20aluminium%20report%20-%20-%2031%20August%202016%20-%20for%20public%20release.pdf>

^{vii} <http://www.forbes.com/sites/williampentland/2016/03/29/lessons-from-the-aluminum-industry-the-hidden-cost-of-chinas-cheap-solar/#ba26b0f5e2a8>

^{viii} <http://www.forbes.com/sites/williampentland/2016/03/29/lessons-from-the-aluminum-industry-the-hidden-cost-of-chinas-cheap-solar/#ba26b0f5e2a8>

^{ix} http://www.realclearpolicy.com/articles/2016/05/26/aluminum_tariffs_dont_work_1626.html

^x http://www.realclearpolicy.com/articles/2016/05/26/aluminum_tariffs_dont_work_1626.html

^{xi} Govt of India(2016): Economic Survey 2015-16, Ministry of Finance, Department of Economic Affairs

- ^{xii} Livemint.com (2016): Indian aluminium set to lose global cost advantage <http://www.livemint.com/Industry/9ZkLkDavBIDOT6yNGxpTJ/Indian-aluminium-set-to-lose-global-cost-advantage.html>
- ^{xiii} <http://aluminiuminsider.com/chinas-influence-in-downstream-sector-rattles-indian-aluminium-makers/>
- ^{xiv} Pillai (2016): Vedanta, Hindalco to continue with cost rationalization, <http://www.livemint.com/Companies/VYzqYxYthNjUvUd73aQjQK/Vedanta-Hindalco-to-continue-with-cost-rationalization.html>
- ^{xv} <http://www.wsj.com/articles/rising-chinese-production-keeps-lid-on-aluminum-prices-1447186082>
- ^{xvi} <http://www.mtlexs.com/metal-news/5920/secondary-aluminium-consumption-in-india-sees-upward-trend>
- ^{xvii} Indian Minerals Year Book 2014, Part II Metals and Alloys: Aluminium and Alumina, Govt of India, Ministry of Mines
- ^{xviii} AAI headquartered in Bangalore represents entire spectrum of Indian aluminium industry and develops mechanisms for utilizing scrap.
- ^{xix} MRAI headquartered in Mumbai represents the recycling industry of India's ferrous and non ferrous metals.
- ^{xx} An ingot is a piece of relatively pure metal that is cast into a shape appropriate for further processing.
- ^{xxi} An **ad valorem** tax is based on the assessed value of an item instead of by a fixed rate. The most common **ad valorem** taxes are property taxes levied on real estate; however, **ad valorem** taxes may extend to a number of tax applications, such as import duty taxes on goods from abroad.
- ^{xxii} Import licensing can be classified as open general or restricted. The open general import license is a notice published in the official gazette, permitting the importation of the goods covered by the license from any of the countries listed in the notice (FAO, 1985).
- ^{xxiii} The Foreign Trade **Policy** of India is guided by the **Export Import** in known as in short **EXIM Policy** of the Indian Government and is regulated by the Foreign Trade Development and Regulation Act, 1992.
- ^{xxiv} DGCIS online trade data, Indian Minerals Year Book, various issues, Ministry of Mines, Govt of India
- ^{xxv} Govt of India (2016): Economic Survey, 2016, Department of Economic Affairs, Ministry of Finance
- ^{xxvi} http://mines.nic.in/writereaddata/UploadFile/NALCO_PDAC_2014.pdf
- ^{xxvii} <http://metalworld.co.in/grabglo.asp>
- ^{xxviii} Nappi C (2013): The Global Aluminium Industry 40 years from 1972, http://www.world-aluminium.org/media/filer_public/2013/02/25/an_outlook_of_the_global_aluminium_industry_1972_-_present_day.pdf
- ^{xxix} Darabshaw (2015): India Looks to New Policies to Promote Scrap Metal Recycling, <https://agmetminer.com/2015/02/23/india-looks-to-new-policies-to-promote-scrap-metals-recycling/>
- ^{xxx} Hazzra A K (2014): A brief perspective on the Indian Metals Recycling Industry, http://www.mrai.org.in/site/assets/files/5259/presentation_by_arnab_kumar_hazra_director_ficci.pdf
- ^{xxxi} Indian Minerals Year Book 2013, Part II Metals and Alloys: Aluminium and Alumina, Govt of India, Ministry of Mines; The Telegraph (2015): Indian Metal Recycling Industry a Sustainable Model, Striving Towards Government's Vision of Swachh Bharat and Make in India - Notes Frost & Sullivan http://www.telegraphindia.com/external/display.jsp?mode=details&id=42552#.VygRQ_197IU

- ^{xxxii} Metalworld (March 2005): Indian aluminium industry Shining to grab global opportunities, <http://metalworld.co.in/grabglo.asp>
- ^{xxxiii} <http://www.thehindu.com/business/Economy/25-import-duty-on-select-metals/article4703048.ece>
- ^{xxxiv} Indian Minerals Year Book, various issues, Ministry of Mines, Govt of India
- ^{xxxv} Indian Minerals Year Book (2014), Ministry of Mines, Govt of India
- ^{xxxvi} http://articles.economictimes.indiatimes.com/2016-04-02/news/71995390_1_iron-ore-export-duty-bauxite
- ^{xxxvii} Captive Power Plants are power plants including Generation Sets, normally established by an industry to meet its own requirements, <https://www.clarke-energy.com/captive-power-plants/>
- ^{xxxviii} <http://www.financialexpress.com/markets/commodities/domestic-aluminium-industry-may-resort-to-production-cuts-layoffs/122919/>
- ^{xxxix} <http://www.balcoindia.com/operation/pdf/aluminium-production-process.pdf>
- ^{xl} Aluminium insider (2016): Global aluminium smelters' production costs on decline
<http://aluminiuminsider.com/global-aluminium-smelters-production-costs-on-decline/>
- ^{xli} <http://www.livemint.com/Companies/VYzqYxYthNjUvUd73aQjQK/Vedanta-Hindalco-to-continue-with-cost-rationalization.html>
- ^{xlii} <http://www.dnaindia.com/money/report-raising-tariffs-on-aluminium-to-impact-power-transport-construction-economic-survey-2182593>
- ^{xliii} Govt of India(2011): Report of the Working Group on Mineral Exploration and Development for the XII Five Year Plan
- ^{xliv} Frost & Sullivan(2015): "Metals and Minerals Practice report"
- ^{xlv} <http://www.mtlexs.com/metal-news/5920/secondary-aluminium-consumption-in-india-sees-upward-trend>
- ^{xlvi} Indian Minerals Year Book (2014), Ministry of Mines, Govt of India
- ^{xlvii} <http://www.nbmcw.com/peb-steel-structures/30407-the-growing-demand-of-aluminium-extrusions.html>
- ^{xlviii} http://www.business-standard.com/article/markets/india-to-lose-rs-11-000-cr-metal-castings-export-market-on-import-levy-113052800686_1.html
- ^{xliv} http://www.business-standard.com/article/markets/india-to-lose-rs-11-000-cr-metal-castings-export-market-on-import-levy-113052800686_1.html
- ^l http://www.indianfoundry.org/cms-index.php?topsubmenu_id=Ng==
- ^{li} <http://www.technavio.com/blog/the-ups-and-downs-of-the-foundry-market-in-india>
- ^{lii} <http://metalworld.co.in/newsletter/2014/Mar14/Coverstory0314.pdf>
- ^{liii} Annual Reports 2014-15 of Nalco, Vedanta and Hindalco
- ^{liv} Calculations based on primary aluminium production statistics in value terms given by Indian Minerals Year Book 2014 and the GDP data given in Reserve Bank publications

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- ^{lv} <http://apps.mmronline.com/foundry/2015/02/aluminium-castings-growth-hinges-on-automotive-sector/>
- ^{lvi} <https://www.indianchamber.org/wp-content/uploads/2015/07/Background-Note-EY.pdf>
- ^{lvii} <https://www.indianchamber.org/wp-content/uploads/2015/07/Background-Note-EY.pdf>
- ^{lviii}^{liii} http://www.igep.in/live/hrdpmp/hrdpmaster/igep/content/e48745/e49028/e63437/e63438/e63447/ResourceDDinautosector_India_Bhattacharjya.pdf
- ^{lix} <https://www.linkedin.com/pulse/materials-automotive-body-chassis-structure-pooyan-nayyeri>
- ^{lx} http://www.business-standard.com/article/economy-policy/cafes-norms-innovation-can-boost-aluminium-use-in-automobiles-analysts-116081201244_1.html
- ^{lxi} http://www.business-standard.com/article/economy-policy/cafes-norms-innovation-can-boost-aluminium-use-in-automobiles-analysts-116081201244_1.html
- ^{lxii} http://www.business-standard.com/article/sme/aluminium-utensils-industry-feels-the-heat-of-competition-114102701348_1.html
- ^{lxiii} http://www.business-standard.com/article/markets/aluminium-utensil-sector-to-grow-20-111121400045_1.html
- ^{lxiv} http://www.business-standard.com/article/sme/aluminium-utensils-industry-feels-the-heat-of-competition-114102701348_1.html
- ^{lxv} <http://www.molhr.gov.bt/molhr/wp-content/uploads/2016/01/Aluminium-Vessels-and-utensils.pdf>
- ^{lxvi} http://www.indiaexportnews.com/detail_news.php?newsid=1893&pageid=2
- ^{lxvii} http://www.indiaexportnews.com/detail_news.php?newsid=1893&pageid=2