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Non-fuel Minerals and Metals

India's Trade and FDI Scenario

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Non-fuel Minerals and Metals

India's Trade and FDI Scenario*

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Abstract

India has abundant mineral resources that have been partially converted into economically mineable resources. India is a leading producer of bauxite, iron ore, and zinc ore. While exports of non-fuel minerals and ores (excluding diamond and precious stones) are US$ 6.6 billion(2019-20), the exports of metals and alloys (excluding precious metals) are much higher at US$ 23.2 billion (2019-20). Similarly, the imports of metals and alloys (excluding precious metals) are higher than non-fuel minerals and ores (excluding diamond and precious stones) at US$ 27.5 billion (2019-20) and US$ 6 billion (2019-20), respectively. The mining sector was opened up to 100 per cent Foreign Direct Investment (FDI) in 2000 to promote exploration and investment. However, from April 2000 to September 2021, the FDI inflows in the mining sector account only for about 0.54 per cent (US$ 3 billion) of the total FDI inflows in the country. In May 2020, the central government launched the Atmanirbhar Bharat Abhiyan to make India self-reliant and attract more investment in the mining sector. This discussion note portrays the trade export-import and price patterns of metals and minerals, including bauxite, iron ore, copper, lead, zinc, magnesite, and phosphates. The nominal and effective rates of minerals and metals are also computed. Finally, it summarises the status of foreign investment and the bilateral relations with other mining jurisdictions.

Introduction

India has a rich inventory of mineral resources and knowhow of metallurgy. It ranks among the top producing countries in some minerals and metals. However, there is inadequate exploitation of converting resources into reserves and implementing these into operating mines.[1]

India produces 95 different minerals, including 88 non-fossil fuel minerals (10 metallic minerals, 23 non-metallic minerals, 55 minor minerals), 4 fuel minerals, and 3 atomic minerals. A summary of India's major minerals and metals is provided in Table 1 with its world rankings. India is a major producer of bauxite, iron ore, and zinc ore, ranking in the top five and has high manganese and lead ore production. Within industrial metals, India ranks 2nd in terms of crude steel production, despite its share of 5.6 per cent in the world steel production, and is a major producer of aluminium (primary), lead (refined), and zinc (slab).

Table 1: Contribution and Rank of India in World Production of Major Minerals and Metals, 2019

Sector	Unit of commodity	Production		Contribution (per cent of world total)	India's rank in the world order
		World	India		
Metallic Minerals					
Bauxite	'000 tonnes	347,100	22,074	6.36	5th
Iron ore	million tonnes	3,040	243	7.99	4th
Manganese ore	'000 tonnes	56,600	2,956	5.22	7th
Copper ore*	'000 tonnes	20,700	30	0.14	35th
Lead ore*	'000 tonnes	4,700	206	4.38	7th
Zinc ore*	'000 tonnes	12,300	726	5.90	5th
Industrial Minerals					
Magnesite	'000 tonnes	29,700	97	0.33	17th
Apatite and Rock Phosphate	'000 tonnes	226,000	1,442	0.64	16th
Metals					
Aluminium (primary)	'000 tonnes	62,900	3,629	5.77	4th
Copper (refined)	'000 tonnes	24,100	407	1.69	13th
Steel (crude)	million tonnes	1,854	104	5.61	2nd
Lead (refined)	'000 tonnes	12,500	599	4.79	4th
Zinc (slab)	'000 tonnes	13,500	563	4.17	4th

Source: https://www2.bgs.ac.uk/mineralsuk/download/world_statistics/2010s/WMP_2015_2019.pdf

**without gangue[2] – gives the quantity of metal contained in the ore*

[1] *Mineral Resources* are defined as natural concentrations of minerals or, in the case of aggregates, bodies of rock that are, or may become, of potential economic interest due to their inherent properties (for example the high crushing strength of a rock or its suitability for use as an aggregate). That part of a mineral resource, which has been fully evaluated and is deemed commercially viable to work, is called a *Mineral Reserve*. (https://www2.bgs.ac.uk/mineralsuk/mineralsYou/resourcesReserves.html)

[2] No deposit consists entirely of a single ore mineral. There are always a mixture of valueless minerals, collectively called gangue. (https://www.britannica.com/science/mineral-deposit#ref624174)
As generally used, gangue minerals have no commercial importance in a particular period of time, possibly becoming ore minerals at a later date. They are commonly silicates, carbonates, or fluorides, more rarely sulphides. (https://link.springer.com/referenceworkentry/10.1007/0-387-30720-6_49)

Mineral Sufficiency

While India has an expansive set of mineral resources and reserves, the exploration and mining potential has not been optimised due to impediments to investors. India is self-sufficient in many minerals such as bauxite, iron ore, and zinc ore. However, the country is deficient in some major minerals, such as magnesite, manganese ore, copper ore, lead ore, and rock phosphate, imported to meet domestic demand (Table 2).

Table 2: Self-sufficiency of Major Minerals and Metals (2018–19)

Commodity	Demand/ domestic consumption@ (›000 tonnes)	Supply/ domestic supply (›000 tonnes)	Order of self-sufficiency
Metallic Minerals			
Bauxite	22,189	23,688	100
Iron ore	159,940	206,446	100
Manganese ore	5,548	2,820	51
Copper ore*	173	34	20
Lead ore*	208	207	99
Zinc ore*	728	729	100
Industrial Minerals			
Magnesite	195	147	75
Apatite and Rock Phosphate	8,802	1,285	15
Metals			
Aluminium (primary)	3,676	3,696	100
Copper (refined)	499	454	91
Lead (refined)	178	198	100
Zinc (slab)	622	696	100

*Source: Ministry of Mines, Annual Report (2020–21); IBM Yearbook 2018–19. @Demand/ domestic consumption = Apparent demand = Production + imports – exports. *without gangue – gives the metal contained in the ore*

Summaries of exports and imports of major ores, minerals, and their corresponding metals and alloys are provided in Tables 3 and 4, respectively. The tables show that India is a net exporter of iron and zinc ores. On the other hand, it is a net importer of bauxite, manganese ore, copper ore, lead ore, zinc ore, magnesite, apatite, rock phosphate, and metals and their alloys such as aluminium copper, iron and steel, lead, and zinc (Table 5).

Exports of iron ore amounting to US$ 2.6 billion (2019-20) constitute about 39.3 per cent of the total non-fuel exports of ores and minerals, followed by exports of copper ore at 4.3 per cent of the total (excluding diamonds, semi-precious, and precious metals and stones). Exports of metals and alloys (excluding the precious metals group) are higher at US$ 23.2 billion (2019-20). Aluminium accounts for 21.9 per cent and iron & steel (finished including crude sheets) at 18.8 per cent. Table 3 shows that bauxite exports declined in 2019–20. China has been a major importer of Indian bauxite, but due to the high export duty on bauxite, the landed cost for Indian bauxite is much higher than ore from Indonesia, Malaysia, and Guinea.[3] On the other hand, iron ore exports jumped up about 126 per cent from 2018–19 to 2019–20 due to high demand from China.[4]

[3] https://www.business-standard.com/article/markets/as-bauxite-loses-traction-fimi-seeks-waiver-of-15-duty-on-exports-120042300518_1.html

[4] https://www.business-standard.com/article/markets/iron-ore-exports-prices-rose-sharply-but-only-eastern-miners-benefited-120080300281_1.html

Table 3: Exports of Major Ores, Minerals, and Metals from 2017 to 2020

Ores, Minerals & Metals	Unit	2017-18		2018-19		2019-20	
		Quantity	Value (US$ thousands)	Quantity	Value (US$ thousands)	Quantity	Value (US$ thousands)
Metallic Minerals							
Bauxite	Th. tonnes	1,529	41,961	1,509	43,556	524	20,038
Iron ore	Th. tonnes	24,203	1,472,163	16,150	1,324,789	36,624	2,623,844
Manganese ore	Th. tonnes	44	7,891	56	1,975	58	3,590
Copper ore*	Th. tonnes	61 (13)	59,032	182 (39)	237,817	213 (46)	288,351
Lead ore*	tonne	1 (0.6)	1	37(21)	29	3 (2)	3
Zinc ore*	tonne	1,206 (603)	487	2,079 (1,040)	1,017	317 (159)	223
Industrial Minerals							
Magnesite	tonne	9,576	2,924	6,273	2,921	5,459	2,073
Apatite and Rock Phosphate	tonne	395	9	1,652	668	257	28
Total non-fuel ores and minerals excluding diamonds and semi-precious and precious metals and stones in 2019–20 (US$ billion)							**6.68**
Metals							
Aluminium& alloys, scrap	Th. tonnes	2,012	4,775,958	2,338	5,703,237	2,371	5,090,635
Copper & alloys	Th. tonnes	511	3,418,196	135	1,001,603	141	853,411
Iron & Steel (finished incl. crude sheet)	Th. tonnes	5,941	5,278,899	4,523	4,664,296	4,631	4,360,490
Lead & alloys, scrap	Th. tonnes	160	396,689	177	403,328	175	372,548
Zinc & alloy, scrap	Th. tonnes	287	956,814	196	599,276	213	569,244
Total metals and alloys value excluding precious metal groups in 2019–20 (US$ billion)							**23.24**

Source: Foreign Trade, IBM Yearbook 2020 Vol I - https://ibm.gov.in/?c=pages&m=index&id=1590

**without gangue – gives the metal contained in the ore mentioned in parentheses (calculated by the authors)*

Table 4: Imports of Major Ores, Minerals, and Metals from 2017 to 2020

Minerals & Metals	Unit	2017–18		2018–19		2019–20	
		Quantity	Value (US$ thousands)	Quantity	Value (US$ thousands)	Quantity	Value (US$ thousands)
Metallic Minerals							
Bauxite	Th. tonnes	1,461	119,866	2,255	191,141	2,247	152,526
Iron ore	Th. tonnes	8,707	656,087	12,808	845,807	1,246	132,674
Manganese ore	Th. tonnes	3,627	785,462	2,784	693,453	4,317	582,064
Copper ore*	Th. tonnes	1488 (322)	4,317,841	824 (178)	1,737,218	822 (178)	1,222,091
Lead ore*	tonne	2220 (1,282)	2,316	1499 (866)	1,221	3283 (1,896)	2,350
Zinc ore*	tonne	-	-	1422 (711)	554	101 (51)	37
Industrial Minerals							
Magnesite	tonne	2,29,628	81,730	4,64,367	159,056	3,65,054	133,497
Apatite and Rock Phosphate	tonne	77,02,634	705,155	75,19,156	806,367	76,54,868	764,285
Total non-fuel ores and minerals excluding diamonds and semi-precious and metals and stones in 2019-20 (US$ billions)							**6.1**
Metals							
Aluminium& alloys, scrap	Th. tonnes	1,958	4,522,636	2,318	5,458,754	2,152	4,384,226
Copper & alloys	Th. tonnes	710	4,509,975	840	5,277,123	897	5,094,273
Iron & Steel (finished incl. crude sheet)	Th. tonnes	4,164	4,627,545	4,247	5,394,979	4,024	5,057,379
Lead & alloys, scrap	Th. tonnes	352	814,467	360	783,136	349	7,038,880
Zinc & alloy, scrap	Th. tonnes	273	827,197	278	807,566	250	650,754
Total metals and alloys value excluding precious metal groups in 2019_20 (US$ billions)							**27.5**

Source: Foreign Trade, IBM Yearbook 2020 Vol I - https://ibm.gov.in/?c=pages&m=index&id=1590

**without gangue – gives the metal contained in the ore mentioned in parentheses (Calculated by the authors)*

Imports of copper ore account for about 20 per cent of the total non-fuel imports of ores and minerals, followed by 9.5 per cent of manganese (excluding diamonds, semi-precious and precious metals and stones). Four metals and their alloys constitute significant shares in the total imports of metals and alloys. The share of lead and alloys accounts for 25.5 per cent, and that of copper and alloys at 18.4 per cent.

India's trade balance on major minerals and metals is shown in Table 5. It is observed that some minerals like bauxite, manganese, copper, and lead have trade deficits. However, India has considerable mineral resources whose potential has not been realised. For example, only 17 per cent of the bauxite resources are converted to reserves in India. Similarly, about 14 per cent of copper ore has been converted into reserves from resources, and 14 per cent of lead ore resources have been explored. India imports large quantities of apatite and rock phosphate minerals. However, India has enormous untapped resources of these minerals, of which only 0.12 per cent have been classified as reserves.[5]

Table 5: Trade Balance of Major Ores, Minerals and Metals from 2017 to 2020

Minerals and Metals	Unit	2017–18	2018–19	2019–20
Metallic Minerals				
Bauxite	'000 tonnes	68	-746	-1,723
Iron ore	'000 tonnes	15,496	3,342	35,378
Manganese ore	'000 tonnes	-3,583	-2,728	-4,259
Copper ore	'000 tonnes	-1,427	-642	-609
Lead ore	tonnes	-2,220	-1,462	-3,280
Zinc ore	tonnes	1,206	657	216
Industrial Minerals				
Magnesite	'000 tonnes	-220	-458	-359
Apatite and rock phosphate	'000 tonnes	-7,702	-7,517	-7,654
Metals				
Aluminium& alloys, scrap	'000 tonnes	54	20	219
Copper & alloys	'000 tonnes	-199	-705	-756
Iron & Steel (finished incl. crude sheet)	'000 tonnes	1,777	276	607
Lead & alloys, scrap	'000 tonnes	-192	-183	-174
Zinc & alloy, scrap	'000 tonnes	14	-82	-37

Trade Balance = exports – imports

Source: Authors' calculation based on Foreign Trade, IBM Yearbook 2020 Vol I (data given in Tables 3 and 4 of this note)

The domestic iron ore price has been one-third of the corresponding international price. Table 6 compares the domestic and international prices for 62% Fe fines and the import and export prices for all iron ore and concentrates categories. Annex-I gives the monthly trend of the domestic and international iron ore prices. The prices have been following an upward trend since 2015.

The domestic prices of iron ore differ from the corresponding international prices. India's cost of production is below the international clearing price. Further, the government has imposed an export duty of 30 per cent on the export of iron ore (Fe content 58% and above). India is not a major player in the international market for iron ore, and its trade does not impact the global clearing price. However, India has much greater potential to produce iron ore and impact international prices.

[5] Indian Mineral Yearbook, Indian Bureau of Mines (Table 1, page 1-3) - https://ibm.gov.in/writereaddata/files/07072020143656Apatite_RPH_2019.pdf

Annex I shows the price movements for aluminium, copper, lead, and zinc. India uses the London Metal Exchange (LME) settlement prices for aluminium, copper, lead, and zinc.[6] The figures show an increasing trend in the prices. However, the global price volatility is subject to the demand and supply forces. In addition, the prices also fluctuate due to the drifts in trade policies, including protectionism and trade agreements, and unforeseen events, including COVID-19 and changing global geopolitics. Such fluctuations have implications on the supply risk faced by importing countries.

Table 6: Comparison of International, Domestic, Export and Import Prices for Iron Ore

Prices in US$ per tonne				
Year	International*	Domestic**	Export	Import
2009	87	16	54	111
2010	135	35	46	169
2011	155	58	105	102
2012	119	46	85	150
2013	125	35	100	145
2014	90	43	91	92
2015	52	29	51	77
2016	54	20	46	64
2017	67	25	58	85
2018	65	35	70	63
2019	87	31	76	89
2020	101	35	54	111

*Source: *International price – Pink sheet, World Bank (62% Fe, fines)*

**Domestic Price – Average Sale Price, Indian Bureau of Mines (62% Fe, fines)*

Export and Import Prices – WITS database (all categories of iron ore and concentrates)

Custom Duties on Ores, Minerals, Metals, and their Products

India levies custom duties on ores, minerals, metals, and metal products. The details of the import duties of principle ores, minerals, and metals are mentioned in Table 7. The World Integrated Trade Solution (WITS) database has been used for the tariff rates. The import weighted applied rates have been used. They are the lowest rates applied between preferential or Most Favoured Nation (MFN) rates. These tariffs are import weighted for each industry using the 6-digit HS level codes. The HS codes have then been concorded with the 105 tradeable sectors of the I-O table. As a result, the import weighted applied rates are lower than the MFN rates, as shown in Table 7.

Ores and minerals are generally less protected than their corresponding finished products. For example, the MFN import duty on bauxite is 2.5 per cent, whereas, on aluminium metal and its products, the duties range from 3.9 to 9.8 per cent.

In the case of iron and steel, the MFN import duty rate on iron ore is 2.5 per cent, while the iron metal and steel are protected between 7.5 to 10 per cent. However, limestone is protected at a higher rate of 5 per cent compared to its product (cement, 3.2 per cent).

As seen in Table 7, India imposes about 2.5 to 5 per cent MFN import duties on ores. Comparisons with developed nations such as Canada, Australia, and the USA show that these economies do not levy such

[6] Rule 44 - https://ibm.gov.in/writereaddata/files/10202016094948MCR_2016_18092016%20from%20SKS.pdf

import duties.[7] On the other hand, Japan has levied import duties on ores and concentrates ranging from 0-7.9 per cent.[8] Canada and Australia are quite liberal in their imports. Metals such as copper, aluminium, lead, zinc, and manganese have no import duties, while their articles have minimal restrictions on imports ranging from 0-7 per cent. The USA has varied import duties on metals and articles thereof ranging from 0-12.5 per cent. Certain products of zinc metal are protected with specific tariffs too.

Table 7: Import Duties on Major Ore, Minerals, and Metals (2015-16)

Sector	Ore (%)		Metals (%)		Products (articles thereof) (%)	
	MFN Rates	Import Weighted Applied Rates	MFN Rates	Import Weighted Applied Rates	MFN Rates	Import Weighted Applied Rates
Aluminium	2.50	1.25	3.95	3.91	9.81	9.08
Iron & steel	2.50	2.47	7.50	7.04	10.00	9.99
Manganese	2.50	2.50	6.25	6.25	10.00	9.99
Copper	2.50	2.37	5.20	4.58	10.00	9.79
Lead	2.50	2.45	5.00	4.64	10.00	10.00
Zinc	2.50	1.20	5.00	4.94	10.00	9.98
Limestone	5.00	4.63	-	-	3.20	3.19

Source: WITS Database https://wits.worldbank.org/tariff/trains/country-byhs6product.aspx?lang=en

MFN Rates are what countries promise to impose on imports from other members of the WTO unless the country is part of a preferential trade agreement (such as a free trade area or customs union).

Import Weighted Applied Rates use the information on India's bilateral trade with other countries with MFN or preferential tariff rates.

The import tariffs mentioned above are the nominal tariff rates. The effective protection rates provide information on protection granted based on tariff rates on intermediate goods (Table 8). The effective rate of protection (ERP) is the percentage of excess domestic value-added, vis-à-vis the world value-added, introduced because of the tariffs and other trade barriers:

$$ERP_j = \frac{(VA_j^* - VA_j)}{VA_j}$$

Where VA_j^* is the value-added of the final product j at free trade prices and VA_j is the value-added at tariff distorted prices. This can be rewritten as:

$$ERP_j = \frac{(t_j - \sum a_{ij} t_i)}{(1 - \sum a_{ij})}$$

Where ERP is the effective rate of protection for final good j, t_j is the nominal tariff for good j, t_i is the nominal protection for all tradeable inputs i, a_{ij} is the fixed-coefficient input of i per unit of output j.[9]

The formula above calculates the effective protection rate of iron ore, bauxite, copper ore, and other metallic minerals and steel and non-ferrous basic metal sectors. The Input-Output table 2015–16 published by CSEP has been used to extract the input coefficients of these sectors.[10]

While the nominal rate of protection (using weighted applied tariffs) of iron ore is 2.47 per cent, the effective rate is much lower (-3.96 per cent) as the weighted tariff of its inputs is greater than 2.47

[7] https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2021/html/tblmod-6-eng.html; https://www.abf.gov.au/importing-exporting-and-manufacturing/tariff-classification/current-tariff/schedule-3; https://hts.usitc.gov/current

[8] https://www.wto.org/english/tratop_e/tpr_e/s397_e.pdf (Table 3.2)

[9] http://www.maxcorden.com/wp-content/uploads/2016/04/Corden.Chapter16.pdf

[10] https://csep.org/discussion-note/input-output-transactions-table-india-2015-16/

per cent. The negative ERP arises due to high shares of tradable inputs and higher nominal duties on these inputs. Similarly, the other metallic minerals sector and the iron, steel and ferroalloys sector have a negative ERP.

Manganese ore, bauxite, copper ore, limestone, mica, cement and non-ferrous basic metals also have a lower ERP than their nominal protection rate. However, they do not have a negative ERP as a smaller portion of the inputs is tradeable for manganese ore, bauxite, copper ore, limestone and mica. At the same time, the tariff on inputs for cement and non-ferrous basic metals is closer to their nominal tariffs (still higher).

The remaining sectors – other non-metallic minerals, structural clay products, other non-metallic mineral products, iron and steel casting and forging; and iron and steel foundries have an ERP greater than the nominal applied tariffs as their inputs are protected at a lower rate.

Table 8: Nominal and Effective Rate of Protection in Major Minerals and Metals (2015-16)

Minerals/ Metals	NRP (tj) – import -weighted	Share of tradeable inputs	ERP	Input Tariffs (ti) – weighted
Minerals				
Iron ore	2.47	52.50	-3.96	8.29
Manganese ore	2.50	18.94	1.38	7.30
Bauxite	1.25	20.97	0.06	5.72
Copper	2.37	7.02	2.01	7.12
Other metallic minerals	2.08	32.77	-1.16	8.73
Lime stone	4.63	25.77	3.60	7.61
Mica	4.18	3.16	4.10	6.58
Other non-metallic minerals	7.18	9.72	7.26	6.45
Metals				
Structural clay products	7.84	29.65	8.48	6.31
Cement	3.19	55.43	1.67	4.41
Other non-metallic mineral products	9.91	42.87	12.72	6.16
Iron, steel and ferro alloys	2.66	65.44	-1.58	4.90
Iron and steel casting & forging	8.54	54.49	11.55	6.02
Iron and steel foundries	9.86	48.63	13.89	5.61
Non-ferrous basic metals (including alloys)	4.16	51.59	2.18	6.01

India also levies export tariffs for certain ores and minerals such as iron ore, manganese ore and bauxite. Export duties are an indirect tax payable when the goods leave the country.[11] As of 2021–22, there is an ad valorem tariff of 30 per cent on the export of iron ore, bauxite, and other aluminium ores.[12] In the case of manganese ore, a specific export tariff of Rs 20 per tonne is applicable. Exports of certain iron and steel products are restricted with an ad valorem tariff of 20 per cent. These export tariff rates have not changed since 2015–16. India imposes an export duty on iron ore to dissuade exports and make it available for domestic steel production. It also provides an additional source of revenue for the government.

[11] https://stats.oecd.org/glossary/detail.asp?ID=910#:~:text=Export%20duties%20consist%20of%20general,multiple%20exchange%20rates%20are%20excluded.

[12] https://www.cbic.gov.in/htdocs-cbec/customs/cst2022-010122/cst-idx

Table 9: Export Duties on Major Ores, Minerals and Metals

Product	Export Tariff
Iron ore and concentrates (for ore with greater than 58% Fe content)	30%
Iron ore and concentrates (National Mineral Development Corporation – all grades)	10%
Manganese ore	Rs 20 per tonne
Bauxite	30%
Other aluminium ores and concentrates	30%
Certain products of iron and steel	20%

Source: Tariff (as on 01.01.2022) - https://www.cbic.gov.in/htdocs-cbec/customs/cst2022-010122/cst-idx

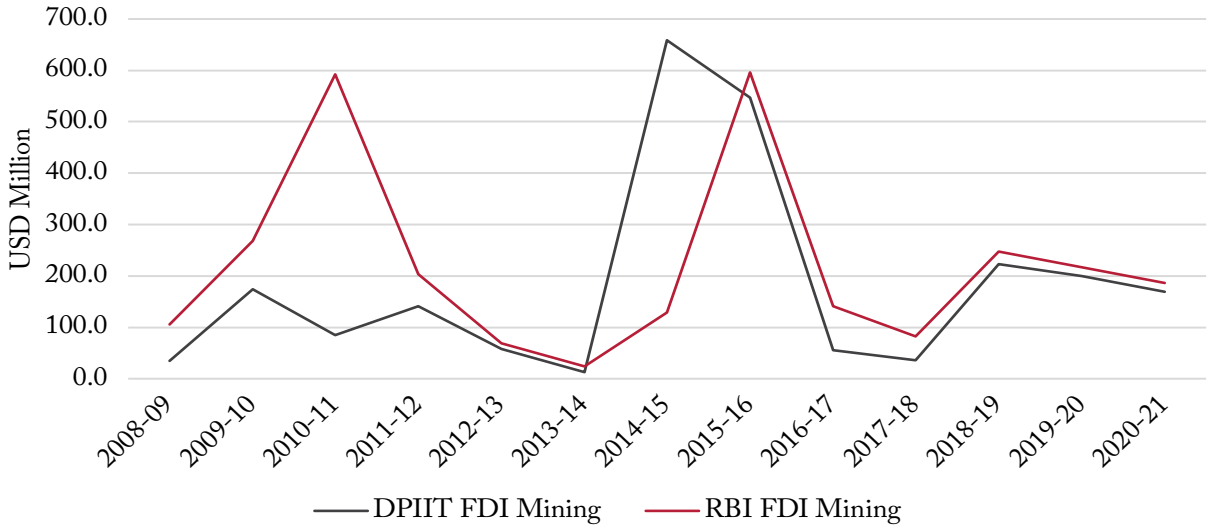
Foreign Direct Investment (FDI) in the Mining Sector

In 1994, the mining sector was opened to private domestic and foreign investors to explore and exploit iron ore, copper, manganese, lead, chrome ore, zinc, sulphur, molybdenum, gold, tungsten, diamond, and the platinum group of minerals. The sector was opened to increase the export of minerals and promote large-scale private investment. However, the investment proposals were considered case-to-case until 1997, when the automatic approval route through the Reserve Bank of India (RBI) was introduced.[13] In 2000, the mining sector was opened up to 100 per cent FDI through the automatic approval route.[14] Figure 1 shows the movement of FDI inflows from 2008–09 to 2020–21. Except for a couple of years, the FDI inflows have been less than US$ 250 million per annum. The total FDI in the mining sector has been about US$ 3 billion from April 2000 to September 2021, that is, about 0.54 per cent of 561 billion total FDI inflows during this period, which is abysmal given India's mineral endowments. The FDI into the mining sector has not been higher due to impediments to setting up the mining facilities. India's mineral exploration came to a near-complete halt after 2010, as new exploration licenses were not issued till the new Mines and Minerals (Development and Regulation) Amendment Act, 2015. As per the Supreme Court directive, the mine allocation process should be transparent, fair, and objective. However, the investors need assurance of the security of title and tenure of their exploration assets to develop these assets from discovery to establishing the geological resource, mine development, mining, processing, and marketing of ore minerals from these assets.

There are differences between the data of FDI inflows from the Department for Promotion of Industry and Internal Trade (DPIIT) and RBI, as shown in Figure 1. The DPIIT considers the inflow received through the government approval route and the acquisition of existing shares.[15] The RBI data on FDI considers the government approval and the automatic approval route.[16] Since 2000–01, in addition to equity capital, the FDI coverage has been expanded to include reinvested earnings (retained earnings of FDI companies) and other capital (inter-corporate debt transactions between related entities). The data on equity capital also includes the equity of incorporated entities.

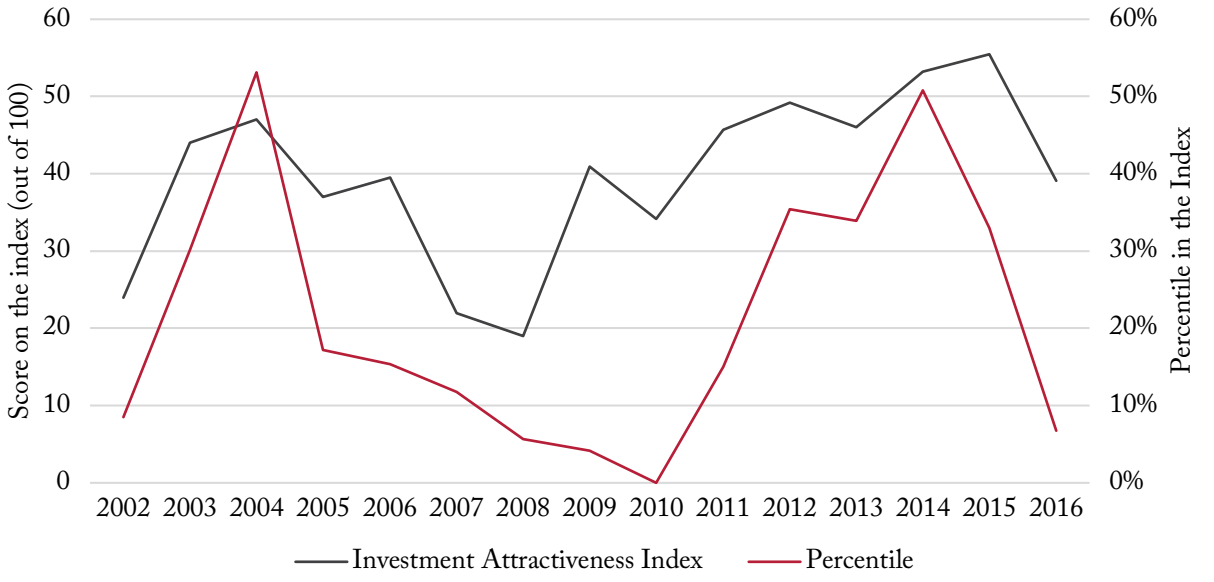
[13] https://www.oecd.org/env/1830307.pdf; https://archive.pib.gov.in/archive/releases98/lyr2003/rfeb2003/25022003/r250220036.html
[14] https://www.fedmin.com/fedmin/synopsis.pdf ; https://dpiit.gov.in/sites/default/files/press2_00.pdf
[15] https://dpiit.gov.in/sites/default/files/FDI_MetaData_13December2021.pdf
[16] https://m.rbi.org.in/scripts/PublicationsView.aspx?Id=20643

Figure 1: Yearly Foreign Direct Investment (FDI) Inflows to India (2008–09 to 2020–21)



While resource endowment is an important factor in determining its attractiveness for mining, the perception of the country's administrative and government functions plays an equally major role in attracting FDI.[17] The Annual Survey of Mining Companies by the Fraser Institute ranks countries based on their policy potential, mining potential, best practices in the sector, and investment attractiveness. The Survey creates the Investment Attractiveness Index, a combination of the Policy Perception Index and the Best Practices Mineral Potential Index. Figure 2 shows the performance of India on the Mining Investment Attractiveness Index. India has consistently performed poorly on the Index and dropped out of the Index since 2017 due to insufficient participation. The top-ranking mining jurisdictions since 2016 have been Nevada (US), Western Australia, Alaska, and Saskatchewan (Canada). Developing countries such as Botswana and Ivory Coast have performed well and rank in the top 20 of the Investment Attractiveness Index, 2016 (India was a part of this Index reporting). Other developing countries such as Brazil, Chile, and most Argentinian mining jurisdictions performed better than India in the 2016 Index. India's performance on the policy perception index and the best practice mineral potential index is shown in Annex II.

Figure 2: India's Performance on the Mining Investment Attractiveness Index



[17] https://www.sciencedirect.com/science/article/pii/S0301420710000462

With the Atmanirbhar Bharat Abhiyan (Self-reliant India Campaign), the central government aims to unlock the mining sector's potential and attract more investment through transparent and internationally competitive policies. One of the measures introduced the composite exploration and mining regime to motivate the private sector to invest and explore.[18] However, the Indian mining sector needs to strengthen its policies to attract investment. The exit of Rio Tinto in 2017 from the Indian mining sector is an example of such policies that led the company to abandon its well-explored Bunder diamond mines project in Madhya Pradesh.[19] Removing the Reconnaissance Permits (RPs) and the First-cum-First-serve (FCFS) exploration permits have been a large impediment to a mining company. In addition, the MMDR 2015 amendments have made it difficult and unattractive for an exploration company to invest in the Indian mining sector and drive any material change (details discussed in Annex-III).

International Cooperation

As shown in Table 2, India is deficient in multiple minerals such as copper ore, phosphates, manganese ore, lead, and magnesite. Therefore, the government has engaged with some mineral-rich countries to access the latest exploration and mineral development technologies. The central government has entered into bilateral agreements with countries like Afghanistan, Australia, Bangladesh, Bolivia, Brazil, Chile, China, Columbia, Finland, Morocco, Malawi, Mali, Mozambique, Peru, United Kingdom, Zambia, and Zimbabwe.[20]

Additionally, in the last financial year (2020–21), two Memorandums of Understanding (MOUs) were signed with Australia and Argentina for the mining and processing of critical and strategic minerals, including lithium, cobalt, and others. These MOUs are important as these critical minerals are susceptible to disruptions in supply due to a deficiency of these minerals in India. Another MOU was signed with Finland for their expertise in data integration and analysis using spatial data platforms using GIS modelling. In addition, the central government has signed MOUs with Bolivia, Chile, Zambia, Brazil, and Morocco in the past few years.[21] The recent Australia-India Economic Cooperation and Trade Agreement (AI-ECTA) is an example of a strategic bilateral partnership. It will help India with its critical mineral needs.[22]

Khanij Bidesh India Ltd (KABIL) is a joint venture between NALCO, HCL, and MECL constituted in 2019. The company was formed to identify, explore, acquire, develop, mine, process, and sell overseas mineral assets for critical and strategic minerals. The main objective of this unique joint venture is to ensure mineral security through a supply of these critical minerals. It is currently pursuing engagements with Argentina, Bolivia and Chile (ABC) and Australia, Russia, Canada, and the USA.

[18] https://www.narendramodi.in/vikasyatra/articledetail/infra-for-growth/utilising-india-s-natural-wealth-for-self-reliance-549960

[19] https://www.newindianexpress.com/business/2017/mar/27/what-made-rio-tinto-dump-the-bunder-diamond-mines-1586262.html

[20] https://mines.gov.in/writereaddata/UploadFile/Mines_AR_2017-18_English_Final%2017052021.pdf

[21] https://mines.gov.in/writereaddata/UploadFile/Mines_AR_2017-18_English_Final%2017052021.pdf

[22] https://www.ndtv.com/business/free-trade-pact-with-australia-could-address-indias-energy-requirements-2866454; https://pib.gov.in/PressReleasePage.aspx?PRID=1812730; https://www.dfat.gov.au/sites/default/files/aiecta-benefits-for-australian-critical-mineral-and-resources.pdf

Concluding Remarks

India is abundant in minerals and is of the top producers of bauxite, iron ore, manganese ore, zinc ore, lead ore, aluminium (primary) and steel (crude). It is self-sufficient in bauxite, iron, zinc and lead ores. Exports of non-fuel minerals and ores (excluding diamonds and precious metals) amounted to US$ 6.6 billion in 2019-20, with imports valued at US$ 6.1 billion. Iron ore exports dominate with about two-fifths of the total exports, while copper accounted for one-fifth of the total imports of non-fuel minerals and ores (excluding diamonds and precious metals). India has trade deficits in minerals such as bauxite, manganese and copper. It has vast resources of these minerals, but less than 20 per cent have been converted into economically viable reserves.

The prices for major minerals and metals such as iron ore, aluminium, zinc, lead and copper have been trending upwards since 2015. The IBM publishes the prices of metals such as aluminium, copper, lead and zinc, as quoted at the London Metals Exchange.

The prices for the other minerals and ores such as iron ore, manganese ore, phosphate and others are also published by IBM. Due to its lower cost of production, domestic prices of iron are generally below the international prices. India is not a major player in the international market for trade in iron ore. It imposes an export duty of 30 per cent on the export of iron ores with more than 58% Fe content.

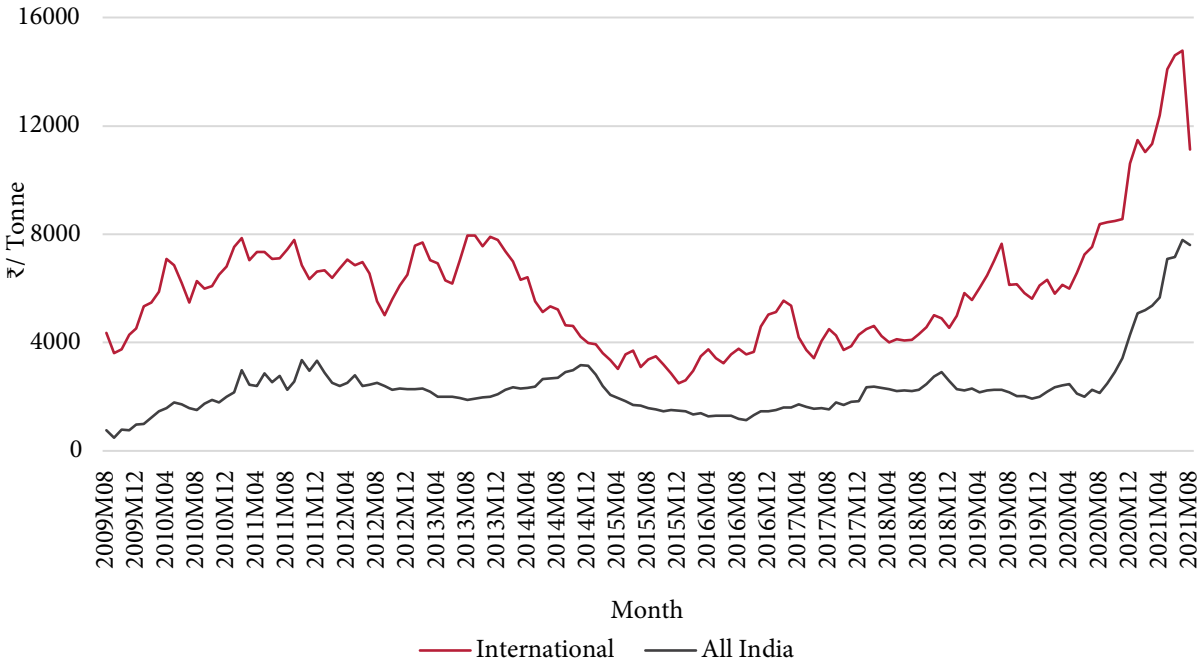
Despite opening up the mining sector to 100 per cent FDI, the inflow into the Indian mining sector has been only about 0.54 per cent of the total FDI inflow from 2000 to 2021. Due to impediments to setting up the mining facilities, these have not been higher. The Fraser Institute in Canada publishes the Investment Attractiveness Index, ranking mining jurisdictions and countries based on their policy potential, mining potential, best practices in the mining sector and investment attractiveness. India used to be ranked low till 2016 and has been dropped out of the Survey since 2017.[23]

The Government of India is engaging with mineral-rich countries to access the latest technologies in exploration and mineral development. It has entered into bilateral agreements with countries like Afghanistan, Australia, Bangladesh, Bolivia, Brazil, Chile, China, Columbia, Finland, Morocco, Malawi, Mali, Mozambique, Peru, United Kingdom, Zambia, and Zimbabwe. KABIL is also pursuing engagements with Argentina, Bolivia and Chile (ABC), Australia, Russia, Canada and the USA. The recent Australia-India Economic Cooperation and Trade Agreement (AI-ECTA) is an example of a strategic bilateral partnership. It will help India with its critical mineral needs.

[23] https://www.fraserinstitute.org/categories/mining

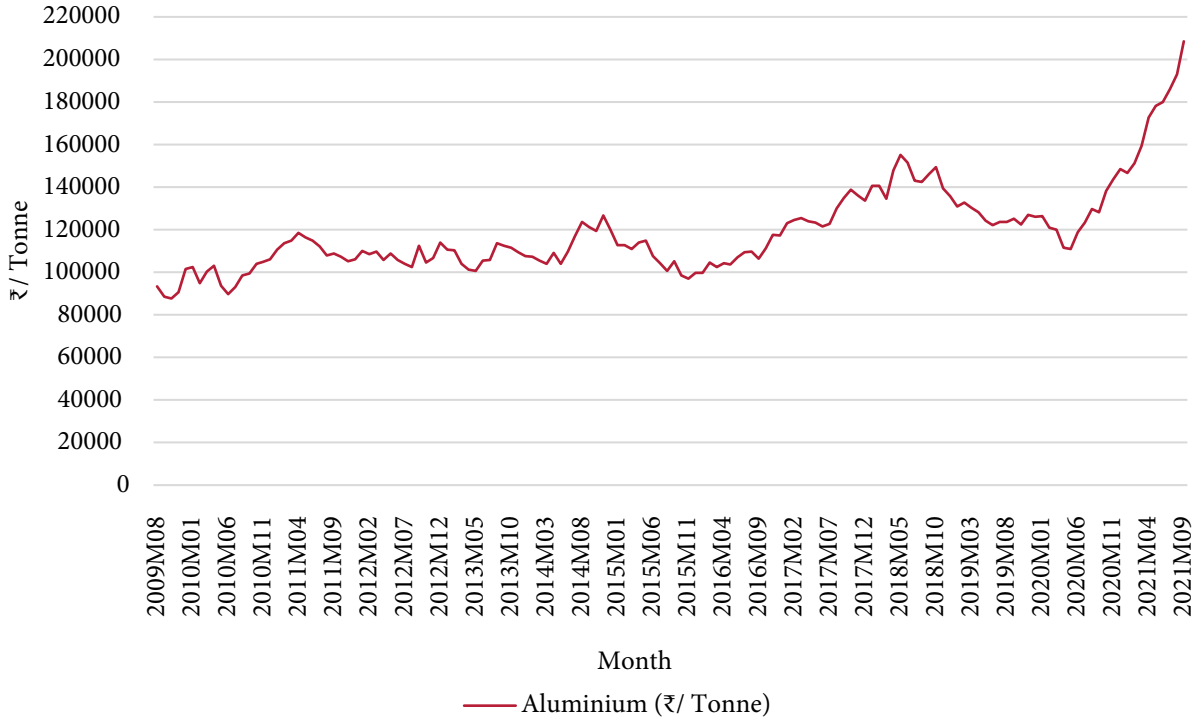
Annex I – Price Movements of Minerals and Metals

Figure 3: International and Domestic Iron Ore (62% Fe fines) Price Movement (2009–2021)



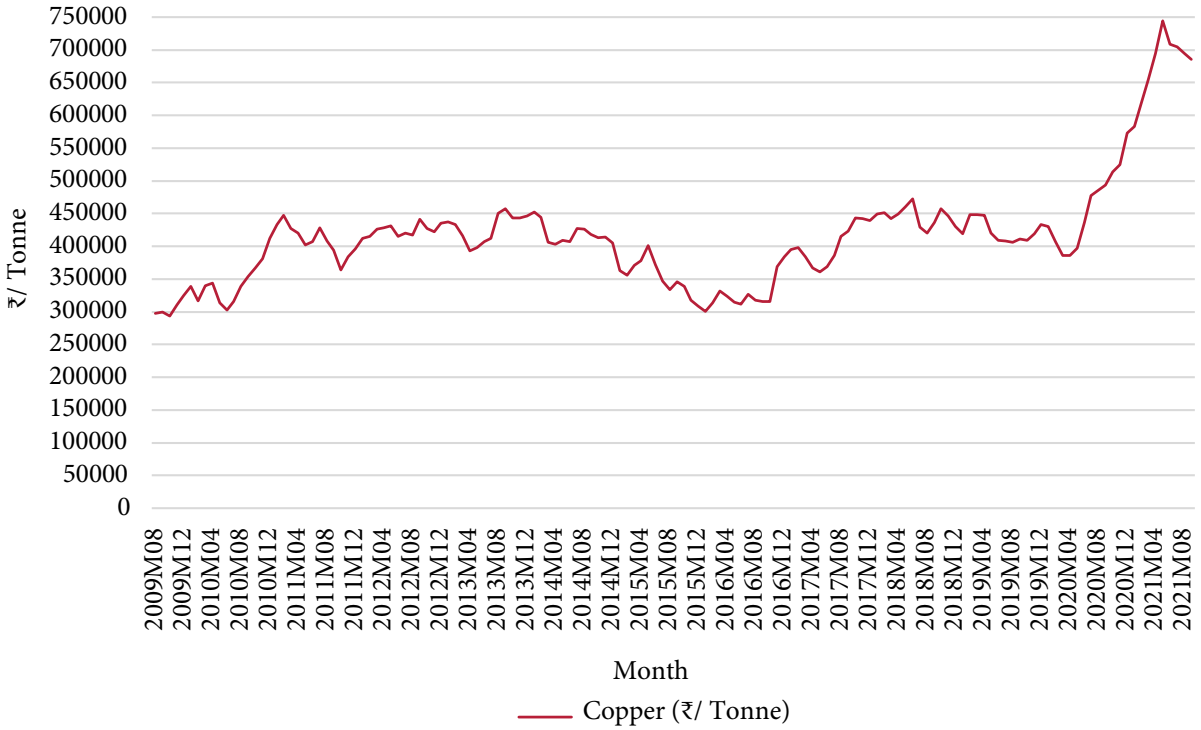
Source: International Prices, World Bank Domestic Prices, Indian Bureau of Mines

Figure 4: Aluminium (LME) Price Movement (2009–2021)



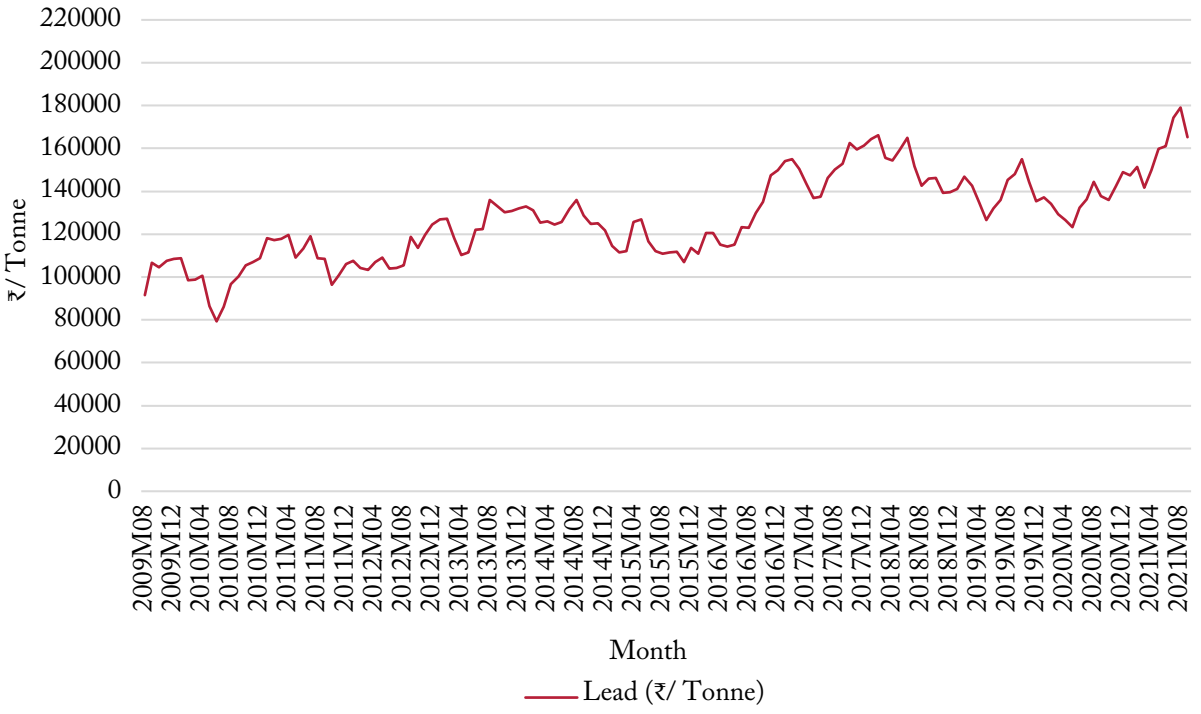
Source: International Prices, World Bank Domestic Prices, Indian Bureau of Mines

Figure 5: Copper (LME) Price Movement (2009-2021)



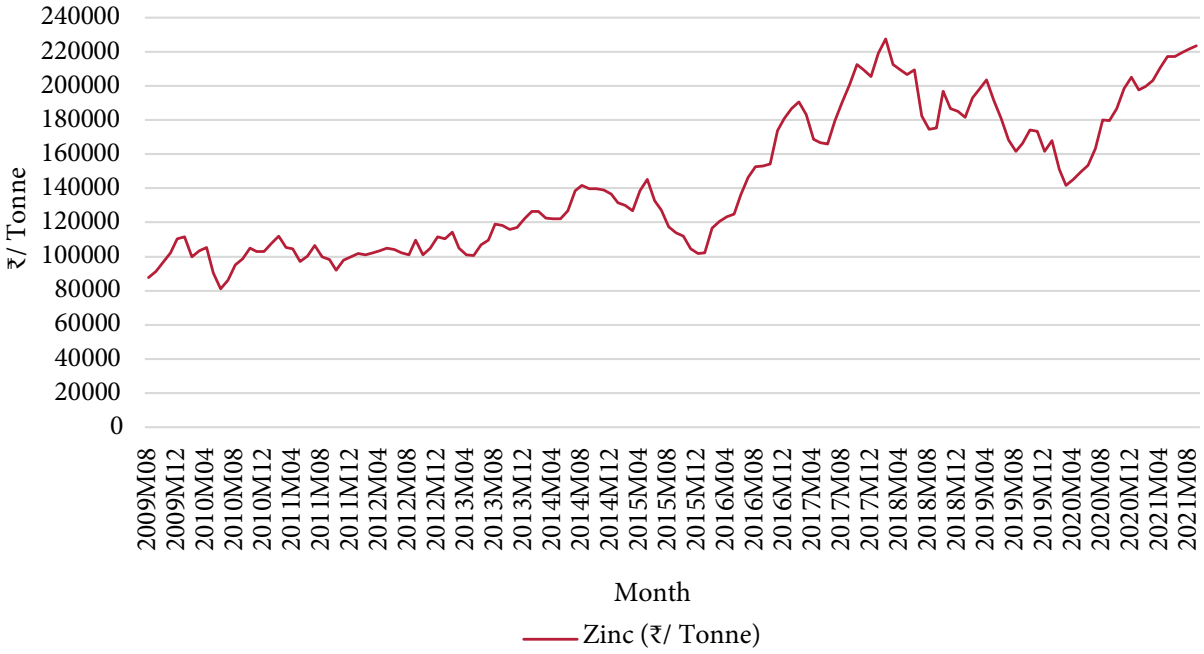
Source: International Prices, World Bank Domestic Prices, Indian Bureau of Mines

Figure 6: Lead (LME) Price Movement (2009–2021)



Source: International Prices, World Bank Domestic Prices, Indian Bureau of Mines

Figure 7: Zinc (LME) Price Movement (2009–2021)

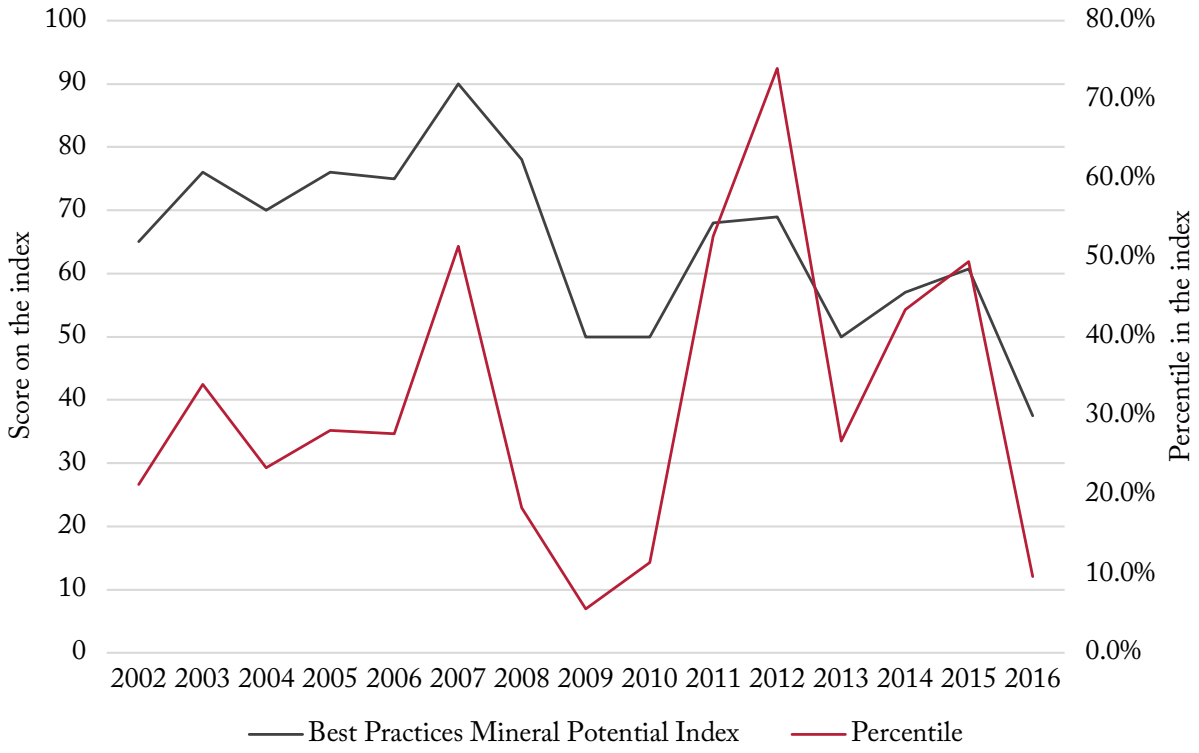


Source: International Prices, World Bank Domestic Prices, Indian Bureau of Mines

Annex II – India's Performance on the Annual Survey of Mining Companies Indices

Figure 8: India's Performance on the Policy Perception Index

Figure 9: India's Performance on the Best Practices Mineral Potential Index



Annex III - Rio Tinto and the Bunder Diamond Block, Madhya Pradesh

"The liberalisation of India's economy in 1991 progressively opened India's major minerals sector to private sector investments. PSUs like Hindustan Zinc Limited (HZL) and Bharat Aluminium Company Limited (BALCO) were disinvested through private sector investments, and many coal blocks were allocated for private-sector captive development. India made significant changes to the Mines and Minerals Development and Regulation (MMDR), 1957 Act to align with the minerals code of the best-known minerals jurisdictions, which allowed private sector investments for mineral exploration in India on assets dispensed on First Come First Serve (FCFS) basis. In about 13 years of exploration, in different phases in different parts of India, since MMDR 1993 and its modified versions were implemented, a few large and some the junior Indian and international companies, including Rio Tinto, De Beers, BHP Billiton, Anglo American, Phelps Dodge, Geomysore India Limited established their exploration units in India and carried out limited but high-quality modern integrated exploration including airborne and ground geophysics, sophisticated remote sensing, geochemistry, and detailed drilling programs. Rio Tinto and De Beers were the most successful in making many discoveries of kimberlites – the source rocks for diamonds. Rio Tinto's Bunder Diamond discovery is hailed as one of the largest diamond deposits found globally in the last two decades." [24]

However, in August 2016, Rio Tinto announced it would not proceed with further development of the Bunder diamond project due to commercial considerations, closed all project infrastructure, and decided to gift it to the Government of Madhya Pradesh.[25] On February 7, 2017, the Rio Tinto Copper & Diamonds chief executive Arnaud Soirat said, "Our exit from Bunder is the latest example of Rio Tinto streamlining its asset portfolio. It simplifies our business, allowing us to focus on our world-class assets." However, he mentioned that Rio Tinto would continue to see India as an important market for its metals and minerals and as a key hub for Rio Tinto's business services. While there might have been commercial considerations, one important impediment was getting environmental clearances.

The Essel Mining & Industries Limited (EMIL) won the auction of the Bunder diamond project and was granted the mining lease by the Government of Madhya Pradesh in December 2019.[26] However, the project is still facing clearance issues. The Forest Advisory Committee (FAC) of the Ministry of Environment, Forests & Climate Change (MoEF&CC), in its meeting held on March 31, 2022, has deferred the proposal citing its observations vide Agenda No. 4.[27] It quotes that "The Standing Committee of National Board for Wildlife in its 39th meeting held on 23.08.2016 in case of Ken-Betwa proposal had recommended that no new mining lease will be granted in this landscape considering its significance in permitting tiger dispersal." The recent FAC meeting concludes that "The project involves diversion of the course of a stream and creation of a waterbody, which may adversely affect the watershed and the flow of water downstream thereby affecting the biodiversity as well as the effectiveness of Ken-Betwa link project. The State Govt. shall examine whether the ecological impact of diversion of stream and creation of water body has been taken into account or not? A detailed report in this regard shall be submitted." Furthermore, "The State Govt. shall submit the latest status of the Original Application pending in the Hon'ble NGT in this regard."

[24] https://csep.org/discussion-note/indias-mineral-exploration-legacy/
[25] https://www.riotinto.com/en/news/releases/Bunder-project-gifted-to-government
[26] https://www.esselmining.com/division/bunder-diamond-block/overview.html
[27] http://forestsclearance.nic.in/writereaddata/FAC_Minutes/4116125112221MoMofFACheldon31-3-2022.pdf

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