ECONOMIC RESEARCH INSTITUTE

REPORT

IRON ORE MARKET STUDY

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Contents

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Background

Iron ores are rocks and minerals from which metallic iron can be economically extracted. Ores containing very high quantities of hematite or magnetite (greater than about 60% iron) are known as "natural ore" or "direct shipping ore", meaning they can be fed directly into iron-making blast furnaces. Raw iron is alloyed with a variety of elements (such as tungsten, manganese, nickel, vanadium, chromium) to strengthen and harden it, making steel useful for construction, automobiles, and other forms of transportation such as trucks, trains and train tracks.

In 2014, top producers of world iron ore are Australia (36%), Brazil (20%), CIS countries (10%), China (10%) and India (6%). 55.5% or 1126 Mt of produced iron ore was used by China, followed by Europe (7.7%), Japan (6.7%), CIS countries (6.6%) and India (6.3%).

TABLE 1. IRON ORE MARKET IN 2014

Countries and regions	Production	- Exports	+ Imports	= Apparent consumption
Europe	43.5	53.6	166.9	156.8
CIS	199.5	78.4	13.7	134.8
NAFTA	115.7	55	15.6	76.4
Brazil	399.4	344.4	0	55
Other Latin America	36.1	31.5	11.9	16.5
Africa	113.2	105.1	5.5	13.5
Middle East	48.5	23.1	26.5	51.9
China*	193.2	0.1	933.1	1126.2
India	129.8	9.8	7.4	127.4
Japan	0	0	136.4	136.4
South Korea	0	0.1	73.5	73.4
Australia	723.7	754.3	3	-27.6
Other Asia and Oceania	30.6	33.5	92.4	89.5
World	**2033.2**	**1488.9**	**1485.9**	**2030.2**

**Production adjusted so that Fe content is similar to world average*
Source: (World Steel Association, 2016)

The estimated size of contestable iron ore market with free entry and exit is about 1.7 billion tons as of 2015 and 61% are controlled by 4 major companies: Rio Tiinto-18%, Vale-17%, BHP-15%, Fortescue Metals-10% (Rio Tinto, 2016).

According to Minerals Database, 98% of the mined iron ore is used to make steel. Iron ore is the raw material used to make pig iron, which is one of the main raw materials to make steel. Other uses for iron ore and iron accounts for a very small amount of the consumption.

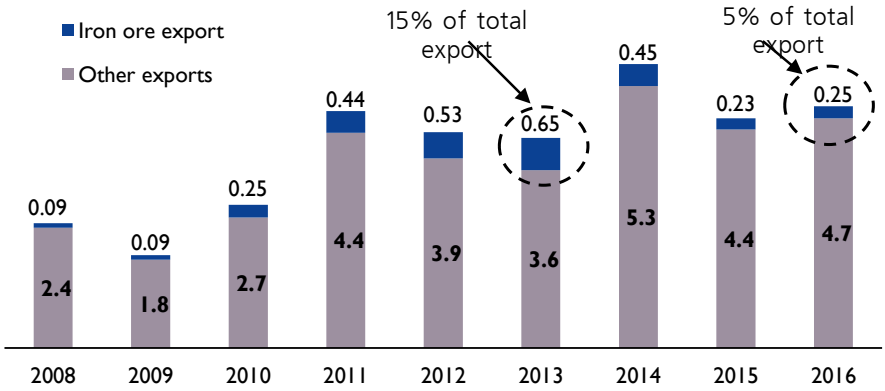
- Powdered iron: used in metallurgy products, magnets, high-frequency cores, auto parts, catalyst.
- Radioactive iron (iron 59): in medicine, tracer element in biochemical and metallurgical research.

- Iron blue: in paints, printing inks, plastics, cosmetics (eye shadow), artist colors, laundry blue, paper dyeing, fertilizer ingredient, baked enamel finishes for autos and appliances, industrial finishes.
- Black iron oxide: as pigment, in polishing compounds, metallurgy, medicine, magnetic inks, in ferrites for electronics industry.

In 2014, building and infrastructure were the largest iron end-use sectors (50%), followed by mechanical equipment (16%) and automotive sector (13%).

Mongolia is rich in iron ore and total geological reserves of crude ore is around 1.7 billion tons as of 2016 (MRAM, 2016). In total, 63 deposits are registered, and 6 deposits have more than 50 million tons of ore. Mining of iron ore started in 2005. Mongolia's iron ore products are mainly a low grade, however on average 6 million tons of iron ore had been exporting to China annually, since 2011.

FIGURE 1. MONGOLIA'S EXPORT OF IRON ORE AND OTHER PRODUCTS, US$ BILLION



Source: (Custom's Office, 2008-2016)

During recent mining boom, Mongolian iron ore mining sector attracted investors like European Bank of Reconstruction and Development and the China Investment Corp who invested multi-millions in some of the large iron ore mining companies. As a result, in 2013, iron ore export reached to a record level constituting 15% of total export. Since then the amount of export decreased because of the fall in the world price and the decline in the production. In 2016, iron ore export constituted 5% of total export.

Iron ore and steel sector employs around 2,500 workers directly and creates 12,500 jobs indirectly in the domestic supply and processing industry. There are 5 registered steel plants including Darkhan Metallurgical Plant. All of them are small in terms of capacity and struggling to compete with Chinese and Russian quality and price. Domestic market of steel is limited as well. So, developing domestic steel producing industry is not considered as a viable strategy for Mongolia (Wuperman, Zorig, Erdenebulgan, & EPCRC, 2015)

Demand side analysis

Almost all of the mined iron (98%) is used to produce steel. So, demand for iron ore is influenced by the steel market and iron ore stocks as well.

Steel market

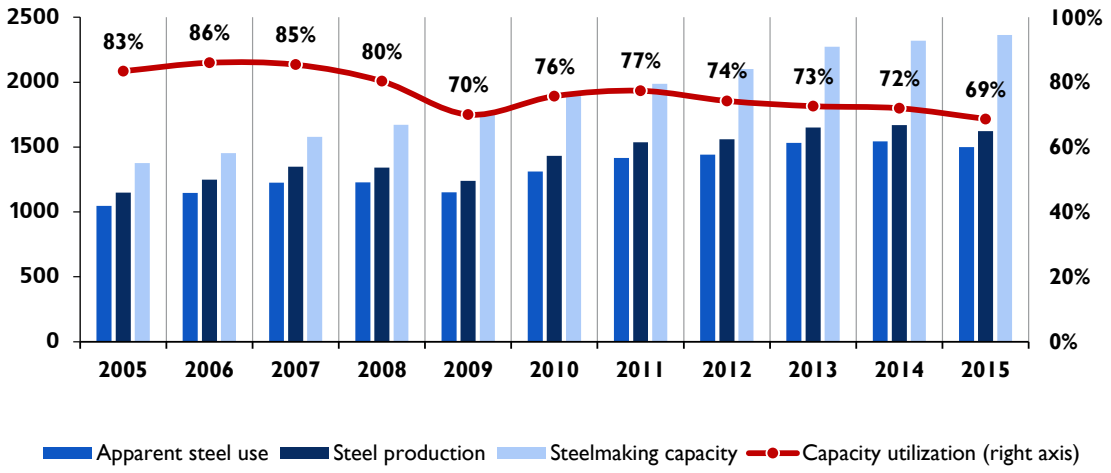
The world crude steel production in 2015 reached 1,623 Mt, decreased by 2.8% comparing to 2014 due to weak global demand for steel (World Steel Association, 2016). Since 2009 global financial crisis, production of steel decreased first time in 2015. However, it was 41% growth from 2005 production level, 95% of this growth came from China.

Production decreased in all regions in 2015 and the largest contributors to the decrease in world production were the major iron ore importing markets, namely Asia and Oceania (-2.2%) and North America (-8.6%). According to Engineering and Mining Journal (2016), in 2015 Chinese crude steel production decreased by 2.3% due to China's shift of focus to domestic, less-steel intensive consumption, from exports and investments.

In World Steel Association report (2016), between 2005 and 2015, global steelmaking capacity continuously increased by 1 billion tons or by 72%. Notably, 90 % of this capacity growth comes from Asia and Oceania region alone. Unlike production, capacity is slower to respond to market price and still increased by 2% in 2015.

Between 2005 and 2015, steelmaking capacity increased by 72% and production increased by 41%. As a result, overcapacity has risen from 228 Mt in 2005 to 741 Mt in 2015. Global capacity utilization rates have declined from 83% in 2005 to 69% in 2015. At the regional level, capacity utilization was not so different in 2015: The capacity utilization in Asia and Oceania was 70%, in EU – 72%, in CIS – 69%, in North America – 68%, in other regions – less than 64%.

FIGURE 2. COMPARISON OF STEEL-MAKING CAPACITY, STEEL PRODUCTION AND USE, MILLION TONS



Source: International Trade Administration (ITA, 2016)

Between 2005 and 2015, world apparent steel use (finished steel products) increased from 1046 Mt in 2005 to 1500 Mt in 2015 and the growth was 43%. The increase in China's

steel use accounts for 72% of the growth and other Asia (mostly India) for 20%. However, the demand decreased by 3% in 2015.

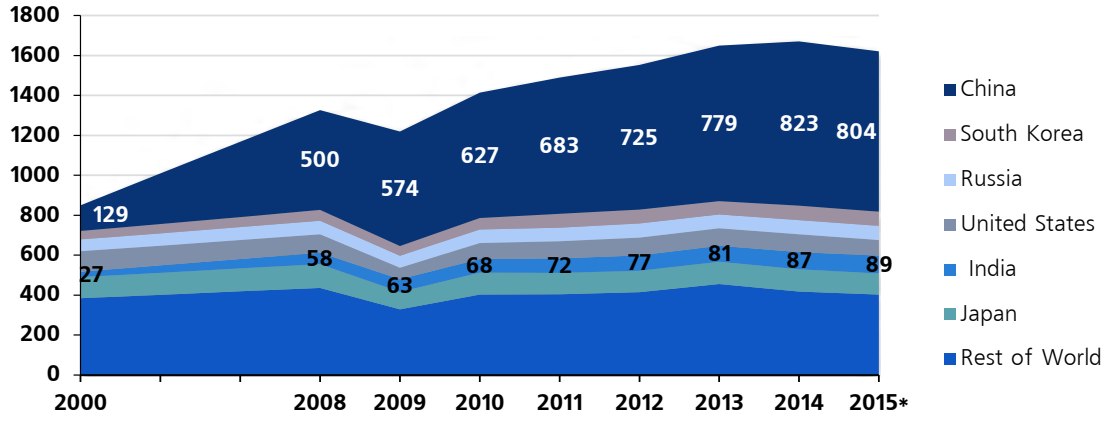
According to World Steel Association, in 2014, 50% of the steel produced globally was used in the building and infrastructure sector, 16% in mechanical equipment, 13% in automotive sector, 11% in consumer and other goods, 5% in shipbuilding and train, 3% in electrical equipment and 2% in domestic appliances.

Demand for iron ore, copper and other metals arise from demand for steel, electric wires and components, and other basic items needed for economic and social development. China's industrial growth and capital investment, such as infrastructure construction are the main factor behind the sharp expansion in global commodity demand and prices over the last 15 years. Specifically, according to Port Jackson Partners (2015):

- Measured as gross fixed capital formation, Chinese investment has grown at an average annual rate of 11% since 2000.
- China's highways have expanded from approximately 1 million kilometers in 1990 to more than 4 million kilometers in 2013.
- Rail investment has resulted in an increase in the length of track from 59 thousand kilometers in 2000 to 66 thousand kilometers in 2012.
- Since 2000, real estate floor space has grown from 7 million square feet to 266 million square feet or 38 times increase.

Chinese demand is the main factor of a doubling of global steel production in the last decade, the primary driver of iron ore demand. Over 2000-2014, China's contribution to steel production growth accounts for 86%, while Asia excluding China contributes 10% and other countries only 4% *(World Steel Association, 2016)*. The production dynamics of main steel producing countries are shown in Figure 3 (also see Table A1 in Appendices)

FIGURE 3. GLOBAL CRUDE STEEL PRODUCTION (MILLION TONS)



Source: World Steel Association (2016)

Top 20 steel-making companies produced 37% of world steel. As shown in table below, 10 of them are Chinese steel manufacturing companies.

TABLE 2. TOP 20 STEEL MILLS AS OF 2015, MILLION TONS

#	Company	Country	Tonnage	#	Company	Country	Tonnage
1	Arcelor Mittal	India	97.1	**11**	Wuhan Steel Group	China	25.8
2	Hesteel Group	China	47.8	**12**	Shandong Steel Group	China	21.7
3	NSSMC	Japan	46.4	**13**	Hyundai Steel	S. Korea	20.5
4	POSCO	S. Korea	42.0	**14**	Nucor Corporation	U.S.	19.6
5	Baosteel Group	China	34.9	**15**	Maanshan Steel	China	18.8
6	Shagang Group	China	34.2	**16**	Thyssenkrupp	Germany	17.3
7	Ansteel Group	China	32.5	**17**	Gerdau	Brazil	17.0
8	JFE Steel Corporation	Japan	29.8	**18**	Tianjin Bohai Steel	China	16.3
9	Shougang Group	China	28.6	**19**	NLMK	Russia	16.1
10	Tata Steel Group	India	26.3	**20**	Jianlong Group	China	15.1

Source: (World Steel Association, 2016)

China's total steel production in 2015 was 803.8 Mt. Out of that, 34% was produced by China's top 10 steel mills as shown on above table. To meet this demand, China imports more than 950 million tons of iron ore from 55 countries. Australia's and Brazil's exports account for 63.7% and 20.1% respectively of China's total iron ore import while Mongolia's export accounts for only 0.6 %.

TABLE 3. TOP EXPORTERS TO CHINA IN 2015

#		Value imported (US$ mln)	Quantity imported (Mt)	Unit value (US$/ton)	Growth in imported value, 2014–2015 (%)
1	Australia	36,002	607.6	59	-34
2	Brazil	12,214	191.7	64	-32
3	South Africa	3,080	45.4	68	-37
4	Ukraine	1,510	20.2	75	-34
5	Canada	708	9.4	75	-49
6	Iran	695	13.1	53	-63
7	Chile	677	9.7	70	-47
8	Peru	594	10.7	55	-40
9	Russia	449	7.2	62	-34
10	Mauritania	408	7.5	55	-57
11	Venezuela	282	4.4	63	14
12	Mongolia	258	5.9	44	-45
13	Sierra Leone	148	2.6	57	-91
14	Liberia	146	2.6	57	-42
15	India	102	2.1	49	-88
	Other	598	13.2	53	-
	Total	**57,871**	**953.2**	**61**	**-38**

Source (ITC, 2016)

Box 1. World's leading steelmakers

ArcelorMittal. With 115 Mt of annual production capacity and 222 thousand employees across 60 countries, the company is the world's leading steel and mining company. It was formed in 2006 from the merger of Arcelor (owned by Spain, France and Luxembourg) by Mittal Steel (Indian owned). ArcelorMittal has steelmaking operations in 19 countries. In 2014, its sales revenue was US$79.3 billion and earnings before tax was US$7.2 billion. Around 38% of its steel was produced in the Americas, 47% in Europe and 15% in other regions. 63.9 Mt of own iron ore production provide security of supply and shelter from raw material price changes. It recycled 31 Mt of steel. The company is focusing on emerging economies, particularly Brazil and India, with joint ventures under way in the Middle East and China (Arcelor Mittal, 2016).

Hesteel Group. The company, known as Hebei Iron and Steel Group Co.Ltd, was established in June 2008 by the merger of Tangshan Iron and Steel Group and Handan Iron and Steel Group of Hebei province. Hesteel group is controlled by State-owned Assets Supervision and Administration Commission of the Government of Hebei province. In 2015, its sales revenue was around US$ 45 billion and total asset was US$ 55 billion. The group has 8 steel branches and the largest subsidiary is Tangsteel which was established in 1943 and has the capacity of 18 Mt per year.

Nippon Steel & Sumitomo Metal Corporation (NSSMC). The corporation was formed in 2012 with the merger of Nippon Steel and Sumitomo Metal. Nippon Steel was formed in 1970 with the merger of Fuji Iron & Steel and Yawata Iron & Steel. In 2014, the group employed 60,500 employees and had a revenue of around US$ 51 billion (NSSM, 2015).

POSCO. The company, formerly Pohang Iron and Steel Company, is a multinational steel-making company headquartered in Pohang, Republic of Korea. The company was established as a joint venture between the Korean Government and TaeguTec corporation in 1968 and began production in 1972. Japan financed the construction of the initial plant through government grants and loans. It operates two integrated steel mills in South Korea and a joint venture with U.S. Steel, which is located in California, U.S., In 2015, the company employed 17,000 employees, and had a revenue of US$ 49.3 billion.

Baosteel Group. In 1978, the Chinese government decided to build a large integrated steel production facility to be located near the port of Shanghai. The Baoshan District, a suburb of Shanghai, was chosen as the site and Japanese assistance was enlisted in constructing one of the most modern steel plants of the time. As of 2012, Baosteel Group (originally Baoshan Iron and Steel) employed 130,000 employees and had annual revenues of around US$ 21.5 billion. In 2016, the group merged with Wuhan Iron and Steel Corporation and the name of the new group is China Baowu Steel Group Corporation. It is now the second largest steel producer in the world, with assets estimated to be worth around US$ 106 billion, employing 228,000 employees and expected annual sales revenues of US$ 47.9 billion.

Another important factor to consider in demand projection of iron ore is recycling steel. One way to make steel more sustainable is to make more of it from scrap, recycling old steel into something new. It is economically advantageous to do so because it is cheaper to recycle steel than to mine iron ore and manipulate it through the production process to form new steel. Steel does not lose any of its inherent physical properties during the recycling process, and needs much less energy and material requirements compared with refinement from iron ore. So, recycling displaces some iron ore demand.

Most industrial and consumer products can be made using recycled scrap, but with scrap in short supply. As demand grows in emerging economies, the gap between the demand and availability of scrap steel is growing. In 2012, for example, there was only enough scrap in Europe to meet about half of the region's demand, the equivalent of 37% of global

requirements. The average recycling rate for steel today is 85%, and some products such as small appliances are recycled much less than this (Arcelor Mittal, 2016).

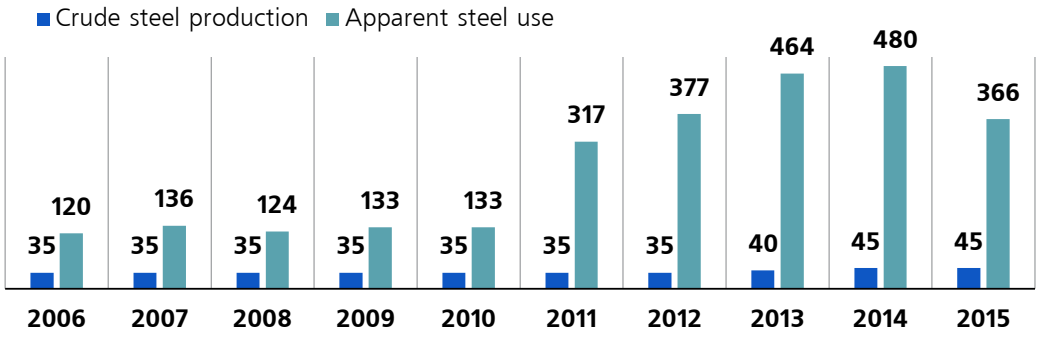
The amount of recycled steel in the world is quite large. For instance, in 2008, more than 475 Mt of steel scrap was recycled while in 2015 it was 650 Mt or 40% of total steel produced (World Steel Association, 2009; Rio Tinto, 2016). The amount of recycled steel in only North America was around 100 million tons in 2016 (Steel Recycling Institute, 2017). The world steel industry applies the principles of reduction, reuse and recycling in many ways, in order to improve the sustainability of the industry. On the other hand, scrap supply will continue to grow in future. For example, according to Rio Tinto (2016), obsolete Chinese scrap from old buildings, power grids and autos will increase by three fold between 2015 and 2030.

Finally, technological advance in steel making is an important factor, as well. According to World Steel Association (2009), in the 1970s and 1980s, modern steel plants needed an average of 144 kg of raw materials to produce 100 kg of steel, while the steel industry today uses 115 kg of inputs to make 100 kg of steel – a 21% reduction. This trend will continue further due to investments in R&D, technology improvements and good management.

Local demand for iron ore

Currently, Mongolia's steel production is lower than its consumption. The largest steel maker is Darkhan Metallurgical Plant which uses local steel scraps for its steel production. Its capacity is 100,000 ton a year, but due to capacity usage is only 50-60%.

FIGURE 4. MONGOLIA'S STEEL PRODUCTION AND USE, THOUSAND TONS

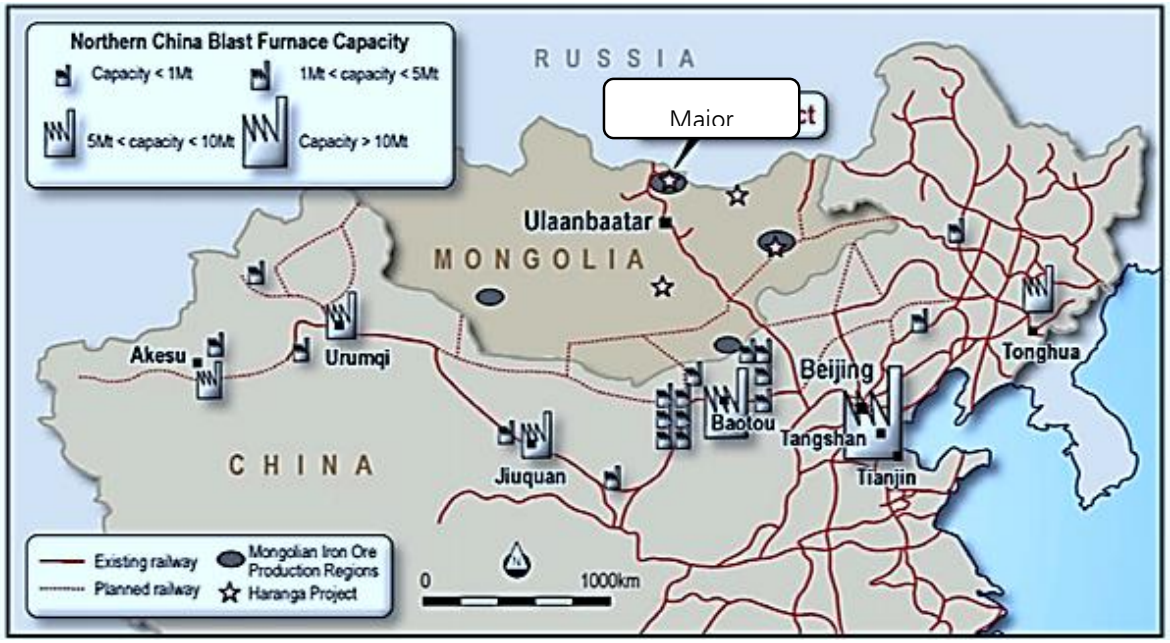


Source: (World Steel Association, 2016).

China's iron and steel producers, such as Baosteel Group Bayi Iron and Steel Co. Ltd., Baotou Iron and Steel Group, and Shougang Mining Investments Co., were participating in iron ore operations in Mongolia. The steel mills in Northern China is shown in Figure 5.

Baotou Iron and Steel Group is the main consumer of Mongolia's iron ore. It is the largest steel, state-owned enterprise in Baotou, Inner Mongolia, China. It produces and sells iron, steel and rare earth materials in China and internationally. It was founded in 1954 and reorganized in 1998 as a group with two listed companies, Baogang Share and Baogang Rare Earth. Its investors are Inner Mongolia government-73.21%, China Orient Asset Management Corp-22.40%, China Cinda Assets Management Co.Ltd, 7.20% and China Huarong Asset Management Corp, 17.35% (Bautou Iron and Steel, 2016).

FIGURE 5. STEEL MILLS IN NORTHERN CHINA



Source: (Haranga Resources, 2013)

Baotou Iron and Steel Group owns three iron ore mines:

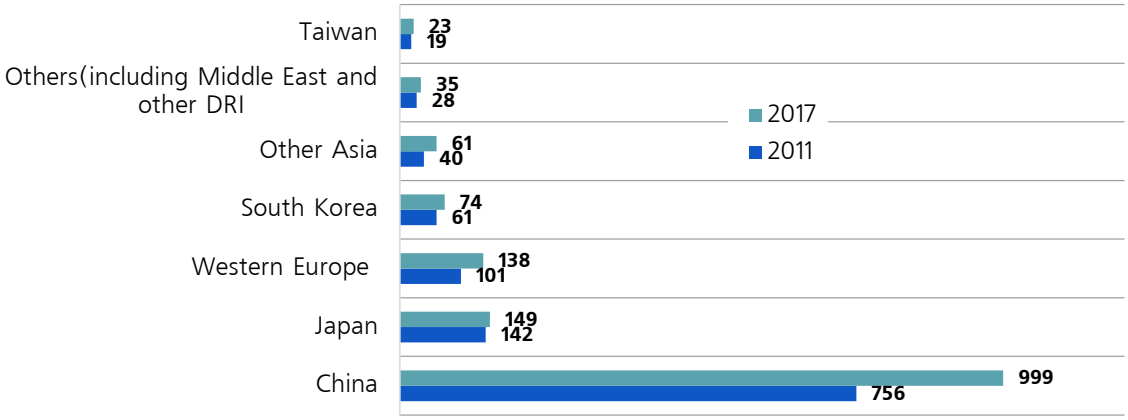
- Bayan-Ovoo open pit mine is in Inner Mongolia and has the reserve of 1.7 billion tons, takes 1st place in Northwest China. While, its rare ore reserve is the biggest in the world, annual capacity is 42 Mt
- Gongyiming open pit mine is in Inner Mongolia and its annual output is 0.2 Mt
- Baotou mine is in Inner Mongolia and its annual output is 10 Mt
- The group owns 50% of Bungalow magnetite mine in Australia.

The main plants cover an area of 35 square kilometers. The steel-making pig iron capacity is 13.4 Mt per year and carbon steel capacity is 11.7 Mt per year. The steel mill produces high quality steel products such as cold and hot rolling strip, heavy plate, seamless pipe, heavy rail, large scale shaped beam, bar and wire rod. Its revenue was US$9.3 billion in 2011 and number of employees was more than 10,000. Baotou steel plant is the closest, around 1500 km by rail road, to Mongolian main iron reserves in Northern Mongolia.

Projection of global iron ore demand

According to Statista (2016), China's seaborne demand of iron ore is expected to amount to around 999 million metric tons in 2017. The figure below represents global seaborne iron ore demand in 2011 and 2017, with a breakdown by region or country.

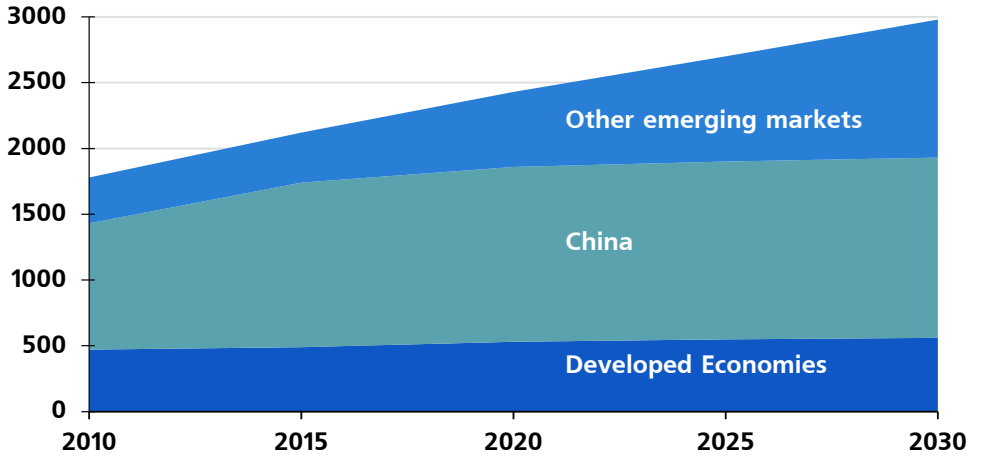
FIGURE 6. GLOBAL SEA BORNE IRON ORE DEMAND PROJECTION



Source: (Statista, 2016)

According to Rio Tinto (2016), iron ore demand will grow moderately in the long run because China's transition toward high-income status leads to slower growth. China's demographic transition, slowing urbanization growth, greater emphasis on services and consumption and tapering of capital intensive investment will be China's 'new normal'. China's annual crude steel demand is expected to reach around 1 billion tons by 2030. Out of that, domestic consumption will remain at current level, around 650 million tons. By 2030, nearly 25% of the current urban residential building stock will be demolished and rebuilt. And newly built constructions will be taller and more steel intensive than old residential. China's passenger vehicles will rise by 280 million from 2015 to 2030, a nearly three-fold increase and over 20 million cars a year will be need to be replaced by 2030 (Rio Tinto, 2016). Obsolete Chinese scrap from old buildings, power grids and autos triples between 2015 and 2030 and it will displace some iron ore demand. However, China's export of finished goods will double and support demand for iron ore because growing global markets generate demand for manufactured exports containing steel (e.g. machinery, cars).

FIGURE 7. MODERATE GROWTH IN IRON ORE DEMAND, MILLION TONS



Source: (Rio Tinto, 2016)

In contrast, the demand for the commodity in other emerging markets such as India and ASEAN will grow dramatically mainly because of their urbanization and industrialization process, which will be highly steel intensive. This process will lead to a significant increase in construction of commercial and residential buildings and infrastructure, machinery and other transport sectors. Specifically, steel demand of other emerging markets will increase by 65% by 2030 and India's share of this demand will double from 10% by the 2030.

Furthermore, Rio Tinto projects that global steel demand will grow by 2.5 % per annum, versus GDP growth of 3.0 %. The world will need 3 billion tons of iron ore by 2030, that is a growth rate of 2 %. Therefore, new supply of iron ore will be required. Over 50 % of the additional supply will be delivered through the seaborne market.

Supply side analysis

Global reserves

Iron ore reserves are among the highest in Australia with 24 billion metric tons of iron content and 54 billion metric tons of crude ore, as of 2015 (Table 4).

TABLE 4. WORLD IRON ORE RESERVES (MILLION TONS):

Countries	Reserves*	
	Crude ore	**Iron content**
Australia	54,000	24,000
Russia	25,000	14,000
Brazil	23,000	12,000
China	23,000	7,200
United States	11,500	3,500
India	8,100	5,200
Ukraine	6,500	2,300
Canada	6,300	2,300
Sweden	3,500	2,200
Iran	2,700	1,500
Kazakhstan	2,500	900
South Africa	1,000	650
Other	18,000	9,500
World total (rounded)	**190,000**	**85,000**

Source: (U.S. Geological Survey, 2016)

** Reserves – that part of the reserve base which could be economically extracted or produced at the time of determination*

Over 90 % of Australia's identified resource resides in Western Australia. Hamersley Province contains a large portion of this resource and is considered one of the world's largest iron ore reserves. The Pilbara region in Western Australia has two major producers, including BHP Billiton and Rio Tinto Ltd. Pilbara Iron is a subsidiary of the Rio Tinto group and has about 6 sites in the region (Table 5).

TABLE 5. THE BIGGEST IRON ORE MINES IN THE WORLD

Mines	Country	Owner	Production, Mt, 2015	Reserve, Bt	Life of the mine, years	Details
Western Australian Iron Ore	Australia	BHP 85%	222	2.8	15	An integrated system of 6 open pit mines and more than 1000 km of rail and port facilities in Pilbara region, Western Australia
Hamersley	Australia	Rio Tinto	189.4	1.72	10	An integrated system of 10 open pit mines and 700 km of rail and port facilitiesin Pilbara region, Western Australia.
Carajas	Brazil	Vale	129.6	7.27	50	3 open pits are operational. And $19.6 bn expansion project. Commence production in 2016, peak production 90 mln tons in 2018
Simandou	Guinea	Rio Tinto 46.6%, Chalco 41.3%	95	1.84	40	$3 bn investment by the end of 2013. Production is expected to start in 2016
Chichester Hub	Australia	Fortescue Metals Group	90	1.51	17	2 open pit mines: Cloudbreak started in 2008 and Christmas Greek in 2009
Solomon Hub	Australia	Fortescue Metals Group	70	0.73	10	2 open pit mines Western Australia.
Sishen	South Africa	Anglo American 69.7%	36	0.919	18	Operational since 1947
Minas Itabiritos	Brazil	Vale	31.6	2.78	31	2 open pits have been operational since 1948 and 2 are since 2003
Karara	Australia	Karara Mining Limited	30	0.955	30	Opened in 2013
Vargem Grande	Brazil	Vale	29.3	2.53	42	3 open pits. Most recent one started operations in 2003
Minas-Rio	Brazil	Anglo American	26.5	2.8	45	Investment of $8.8bn. its start-up to the end of 2014.
Samarco Alergia	Brazil	BHP 50% and Vale 50%	25.4	2.97	37	2 open pit mines have been operational since 2000

Source: (mining-technology.com, 2014; mining.com, 2015; Anglo-American, 2016; BHP Billiton, 2016; Rio Tinto, 2016; Fortescue, 2016; Vale, 2016; Glencore, 2016)

China's vast iron ore reserves are concentrated in few regions and the table below shows them.

TABLE 6. CHINA'S TOP 9 REGIONS OF IRON ORE RESERVE

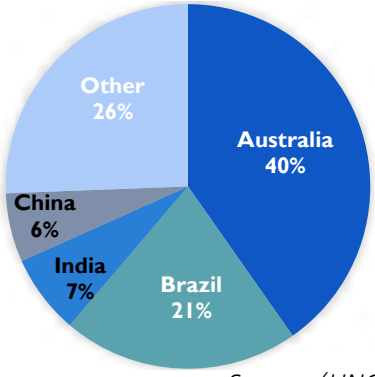
	Region	Reserve, Bt
1	Liaoning	5.21
2	Sichuan	2.92
3	Hebei	2.67
4	Inner Mongolia	1.36
5	Shanxi	1.34
6	Shandong	0.90
7	Anhui	0.84
8	Hubei	0.59
9	Gansu	0.55

Source: www.umetal.net

Global production

The iron ore production reached 2,015 million tons in 2015, decreased by 2.5% comparing to 2014 (UNCTAD, 2016). Top four producer countries of iron ore are Australia, Brazil, India and China. They produced 74% of world supply in 2015.

FIGURE 8. TOP PRODUCER COUNTRIES OF IRON ORE



Source: (UNCTAD, 2016)

Australia and Brazil are among the world's largest iron ore mine producers, producing 811.2 and 422.5 million metric tons, respectively, in 2015. Their production growth in 2015 were 12% and 6% while China's production decreased from 193.2 million tons in 2014 to 123 million tons (by 36%) in 2015. Although China is one of the main producers, the sector is fragmented by around 3,600 small mines and capacity of them is mostly less than 0.5 to 1 million ton per year (UNCTAD, 2012). As iron ore price recovering back in 2016, operating rate of Chinese domestic ore miners grew and its expected annual production is 233 Mt.

Production of 8 biggest companies accounts for 37% of world iron ore production as of 2015, but they control almost all of iron ore trade.

TABLE 7. IRON ORE PRODUCTION BY MAJOR COMPANIES, MT, YEAR ENDED DECEMBER 31

#	Company	Country	Number of mines	2013	2014	2015	Earnings from iron ore (2015), mln US$
1	Vale	Brazil	11 open pit mines in Brazil	310.7	332.1	346.1	4105
2	Rio Tinto	Australia	15 open pit mines, rail and port facilities in Australia, and 3 mines in other countries	209	233.6	263	7872
3	BHP Billiton /Year ended 30 June, next year/	Australia	6 open pit mines, rail and port in Western Australia, and a mine in Brazil	203.6	232.5	227.0	5599
4	Fortesque /Year ended 31 March, next year/	Australia	4 open pit mines and rail and port Hedland in Australia	124.2	165.4	169.4	3195
5	Arcelor Mittal	India	Mines in 9 countries such as Brazil, Canada, Kazakhstan, Ukraine etc.,	58.4	63.9	-	-
6	Anglo-American	UK and South Africa	Kumba (Sishen, Kolomela, Thabazimbi) in South Africa and Minas-Rio in Brazil.	42.4	48.9	54.1	1026
7	Glencore	UK and Switzerland	Askaf, Australia (97.5%); El Aouj Joint venture, Mauritania (44%), Zanaga (51%)	33.2	66	41.2	-14
8	Cliffs Natural Resources	USA	5 open pit mines in the US and 1 in Australia	31.4	33.8	31	352
Share of the companies in world production				**32.1%**	**34.4%**	**37.2%**	

Source: (Anglo-American, 2016; BHP Billiton, 2016; Rio Tinto, 2016; Fortescue, 2016; Glencore, 2016; Vale, 2016; Arcelor Mittal, 2016; Cliffs Natural Resources, 2016; Vedanta, 2016)

Local supply analysis

Mongolia is rich in iron ore and total geological reserves is around 1.7 billion tons as of 2016 (MRAM, 2016). In total, 63 deposits (16.5% to 55.6% Fe, magnetite type) are registered. A brief description of major iron ore mines is shown in the table below.

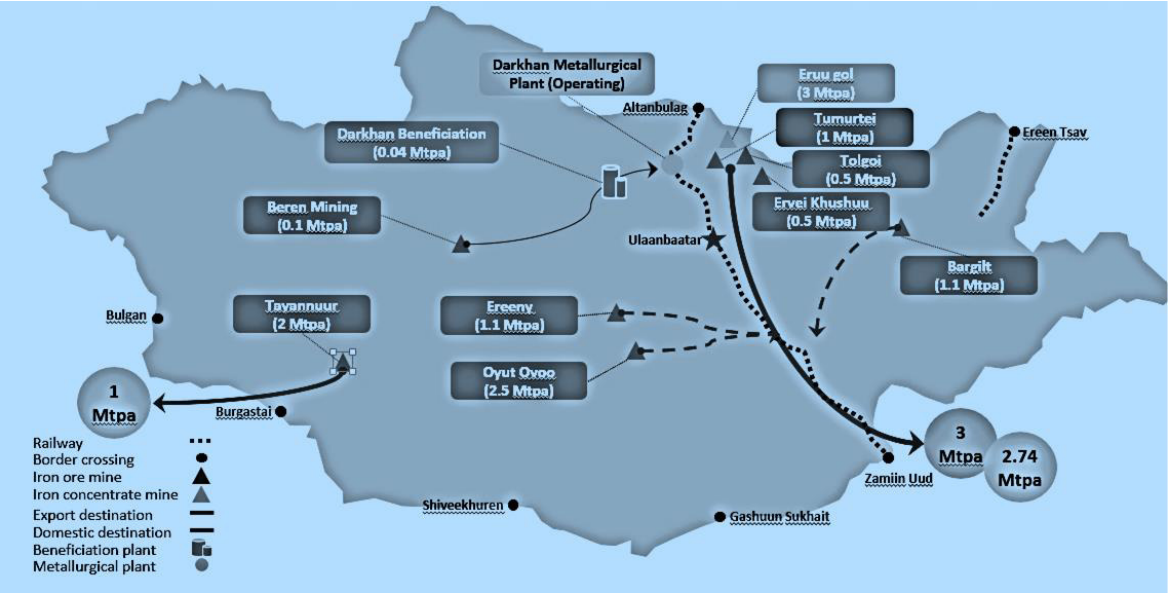
TABLE 8. MONGOLIAN MAJOR IRON ORE RESERVES, MT

Deposits	Crude ore	Owner	Details
Bayantsogt	249	Haranga Resources	The mine is located in Eruu soum, Selenge province. Average grade is 16.5% of iron. The deposit has not been developed.
Tumurtei	230	Darkhan Metalurgical Plant, 100%	This open pit mine is located in Khuder soum, Selenge province and 90 km from the main railroad. Ore grade is 50-51.6%. The mine is only strategic, iron ore deposit by Mineral Law of Mongolia. Started its operation in 2011. Planning to supply the raw material for Darkhan Metallurgical Plant. (www.dmp.mn)
Bayangol	174	Bold Tumur Eruu Gol LLC, 100	This open pit mine is located in Eruu soum, Selenge province and has own rail facilities directly connected to the main railroad. Ore grade is 49.6%. Started its operation in 2007. Invested US$1.5 billion. The projected mining capacity is 6 million tons a year.
Tayannuur	101	Altain khuder LLC, 100%	This open pit mine is located in Tseel soum, Govi-Altai province and is 168km from the border of China. In 2008, Altain khuder LLC signed a long-term supply contract with Bayi Steel, a Chinese subsidiary company of Baosteel, and has been shipping iron ore concentrate since 2009. (www.altainkhuder.mn)
Tumurtolgoi	25	Darkhan Metalurgical Plant 100%	This open pit mine is located in Khongor soum, Darkhan province and is 28 km from Darkhan Metalurgical Plant and 20 km from main railroad. Started its operation in 2009. Ore grade is 57.2%. (www.dmp.mn)

Source: Company web sites, (Boldtumur Eruu Gol, 2014), Mongolian Mining Journal (2014)

As of 2013, 9 magnetite iron ore projects existed in Mongolia with estimated total resources of 1,250 Mt (Fe content of 25% - 52%). Out of them, 5 projects had Chinese investors and only one project, Bold Tumur Eruu Gol, was iron concentrate mine.

FIGURE 9. MAIN IRON PROJECTS, THEIR GEOGRAPHICAL DISTRIBUTION AND PROJECTED CAPACITY IN 2013



Source: (ERI, 2014)

However, in 2015, 5 iron ore mines were operated (EITI Mongolia, 2015). Out of them, Darkhan Metallurgical Plant is planning to use the extracted ore as a raw material in its steel plant.

TABLE 9. MONGOLIAN IRON ORE MINERS' SALE, 2015

	Quantity (thous.ton)	Sales (MNT.bln)	Sales (US$.mln)[1]
Bold Tumur Eruu Gol	3,370	199.8	101.4
Altain Khuder	982	68.5	34.8
Darkhan Metalurgical Plant	750	27.3	13.9
Mongolrostsvetmet	168	28.3	14.4
Jinhua Ord	73	3.3	1.7

Source: (EITI Mongolia, 2015)

According to Custom' Office, main destination of Mongolia's export of iron ore is China.

[1] *According to NSO, average exchange rate was USD 1 = MNT 1970.66 in 2015*

TABLE 10. MONGOLIA'S IRON ORE EXPORT BY DESTINATION COUNTRIES

		2011	2012	2013	2014	2015	2016*
	Quantity (thous.ton)	5,802.0	6,415.9	6,724.5	6,324.7	4,531.4	5,844.2
China	Amount (mln.US$)	441.5	532.5	654.3	446.4	206.9	240,3
	Price (US$/ton)	76.0	83.0	97.3	70.6	45.5	41,1
	Quantity (thous.ton)	-	-	-	-	533.7	240,6
Singapore & Hong Kong	Amount (mln.US$)	-	-	-	-	20.3	9,6
	Price (US$/ton)	-	-	-	-	38.1	39.9

Source: (Custom's Office, 2008-2016)
**-preliminary result*

Iron ore transport

Mongolian iron ore is mainly shipped by railroad because local road transportation tariffs are about 8 times higher than railroad tariffs. However, most of iron ore deposits are small and far from main rail road. So, building railroads for all of these deposits is not financially viable (MRAM, 2016).

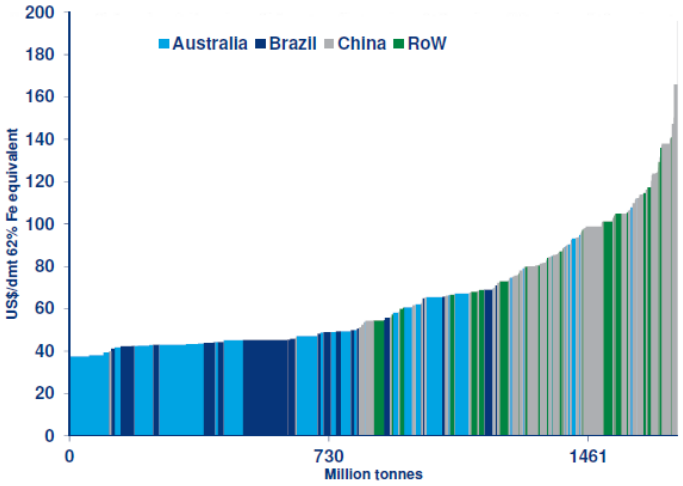
The major iron ore reserves in Northern Mongolia are connected to the main rail road and iron concentrates are shipped to Chinese steel mills directly via the railway. However, railway tariff is relatively high in Mongolia, US$ 0.015 per ton km and no significant discounts for long distance transportation given by the only carrier operating-Ulaanbaatar Railways, a joint-stock company owned 50% by the Government of Mongolia and 50% by the Russian Railways. For example, Bold Tumur Eruu Gol, the biggest iron ore mining company, has built 85 km of railway line connecting its mine in Eruu district, Selenge province to Ulaanbaatar Railways, the main road (ADB, 2014). In total, the distance between the mine and the Chinese border is 1,100 km and it leads to a cost of US$ 17 per ton only for domestic transportation. Cross-border transportation also takes significant additional cost because Ulaanbaatar Railways has established higher tariff for cross-border transportation to cover losses from domestic freight and from passenger transport.

Altain Khuder, the second largest exporter, transports iron ore by road from Tayannuur deposit which is located at the southwestern Mongolia to Xinjiang, China. This mine is located 168 km from the Chinese border. Most of its iron ore concentrates is shipped to Baosteel Group Bayi Iron and Steel plant, the main customer at Urumqi, Xinjian which is situated another 670 km from the border. Although road transport tariff is higher and distance is longer, total transport cost is still competitive than seaborne iron ore supply from Eastern China. To reduce its transportation cost by 25% and its environmental impact, Altain khuder started constructing paved road (Steinweg & Schuit, 2014)

Supply cost structure and main factors

According to Wood Mackenzie (2014), unit cost of Australian majors (Rio Tinto, BHP, Fortescue Metals) is $40-50 per metric ton while the cost of most Chinese mines is greater the $90 per ton. In

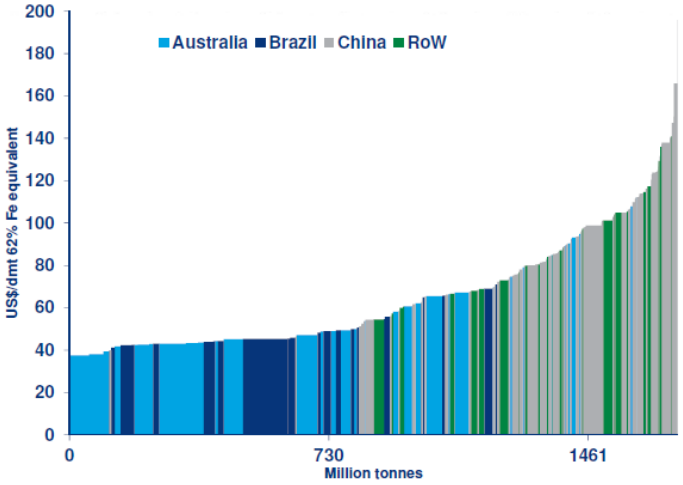
FIGURE 10. GLOBAL COST CURVE OF IRON ORE MINING, NORMALIZED TO 62% FE



Source: (Wood Mackenzie, 2014)

, the lowest cost is $38 per ton in Hamersley mine in Australia and the highest cost is more than $160 per ton (several mines in China). Chinese producers dominate the top quartile because they are deeper underground as well as their small capacities. Interestingly, cost of state owned enterprises marginally lower than cost of private mines in China.

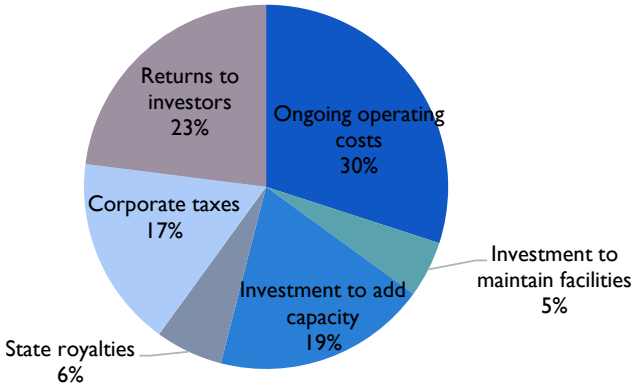
FIGURE 10. GLOBAL COST CURVE OF IRON ORE MINING, NORMALIZED TO 62% FE



Source: (Wood Mackenzie, 2014)

When we disaggregate cost of Australian miners, their operation cost is only 30 % while investors and state take 23 % each as shown in Figure 11.

FIGURE 11. ALLOCATION OF AUSTRALIAN IRON ORE VALUE (2010–2014), % OF A$ REVENUE EARNED

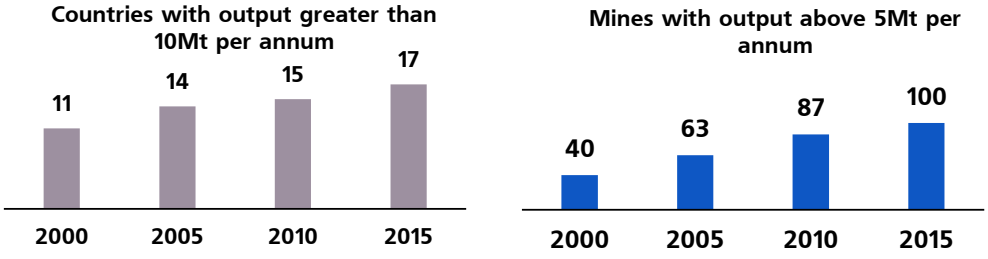


Source: (Port Jackson Partners, 2015)

Supply outlook and FDI

A change in China's economic strategy decreased the use of steel, and signs of demand growth in other parts of the world were not enough to offset China's slowdown. At the same time, the world's largest iron ore mining companies not only expanded production in Australia, but also elsewhere, leading to a substantial oversupply. Closures of capacity, particularly in China, were not large enough to offset these expansions and many mining projects under development were halted or shelved.

FIGURE 12. GROWTH IN IRON ORE PRODUCTION OF SCALE, NUMBER



Source: (Port Jackson Partners, 2015)

Australian iron producers that have increased production between 2012 and 2014 including Fortescue Metals Group (up 97 million tons), BHP Billiton (52 million tons) and Rio Tinto (42 million tons).

According to UNCTAD (2016), an estimated 109 Mt/y of iron ore capacity was added in 2015, and 115-236 Mt of new mining capacity is expected to come on stream by end-2018. Some closures will take place but UNCTAD expects a net addition to iron ore mining capacity over the three-year period.

Bloomberg Intelligence reported that 29 new iron ore projects are financed. Of which, from 2015 to 2020, 14 projects are under the status of operating, ramping up, under

construction, or waiting approval[2] in Australia, 3 in Brazil and 2 in Africa. Others are suspended or have uncertain start-up.

TABLE 11. NEW IRON ORE SUPPLY: GEOGRAPHIC BREAKDOWN

	2015	2016E	2017E	2018E	2019E	2020E
Total new production, Mt	977.4	1076	1160	1227	1262	1267
Australia	79.5%	78.4%	77.3%	75.0%	74.1%	74.2%
Brazil	15.7%	17.9%	19.2%	21.7%	22.7%	22.6%
Africa	4.7%	3.6%	3.4%	3.3%	3.2%	3.2%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: (Bloomberg, 2016)

Iron Ore Trade

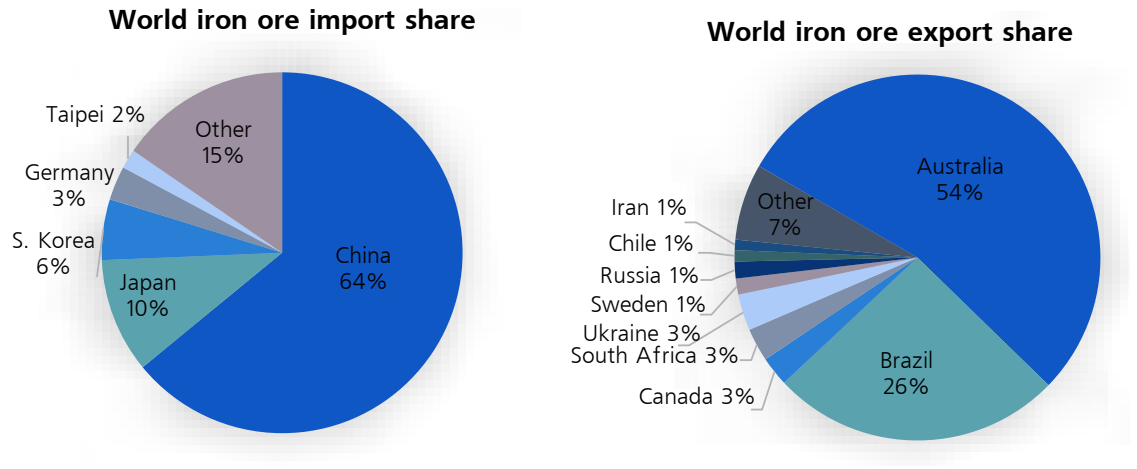
World iron ore trade increased rapidly during last few years. The growth in trade reflected changes in the geographical distribution of production, with a considerable increase in Chinese imports as a result of closures of domestic capacity. The increase is almost entirely due to higher Chinese imports. China accounted for 57% of the increase in world imports in 2013 and for 88% in 2014. Global seaborne iron ore trade increased in 2014 by 12.4 %, to 1,356 million tons. Considerable excess tonnage remained in the world shipping industry and freight rates stayed low.

According to International Trade Centre, world total import of iron ore (including roasted iron pyrites) was 1419.8 million tons in 2015. In addition, world total import value is US$ 90.3 billion. It means that average unit price of imported iron ore is US$ 64 per ton. Number of countries which imported more than 1 million tons of iron ore is 39, but the share of only 3 countries, China, Japan and Korea, is 80 % of total import (see Table A2 in Appendices for other major iron ore importers).

In comparison, world export value is US$ 67.3 billion and average unit price of exported iron ore is US$ 47 per ton. The difference between average import and export price is US$ 27 ton. Number of countries which exported more than 1 Mt of iron ore is 25, but share of Australia and Brazil is 80% of export market (see Table A3 in Appendices for other major iron ore exporters).

[2] In Australia, Frotescue Metals Group Ltd, Baosteel Group Corp. and Formosa Plastics Corp. are developing Iron Bridge magnetite joint venture. A decision was made to fund increase to 10Mtpa scheduled for 1H16. It could mean approximately, 20Mtpa of magnetite to global market at full capacity. Stage 2 of the Iron Bridge project remains subject to successful Stage 1 process validation and approval by the joint venture partners.

FIGURE 13. WORLD IMPORT AND EXPORT SHARE OF IRON ORE IN 2015, BY VOLUME

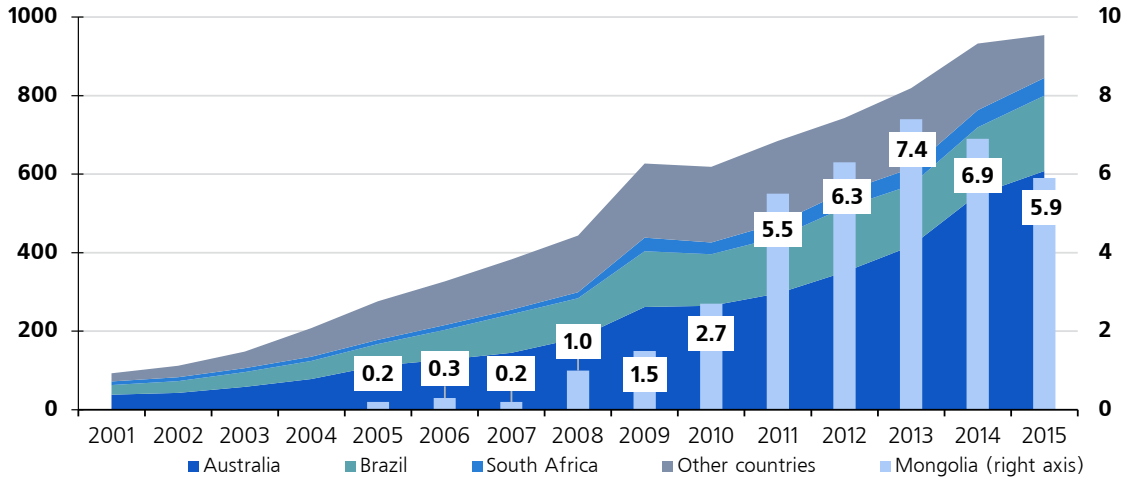


Source: (ITC, 2016)

Almost two thirds of global iron ore import went to China. It is close to the finding of another study which estimated that China accounts for nearly 70% of global iron ore demand (PwC, 2016). There are over 3,600 enterprises operating in the industry in China, with total employment of 567,600 and expected total output of 1.3 billion tons of iron ore in 2016. China covers over one-third of its domestic demand with imported iron. (IBIS World, 2016)

According to ITC, China imported 953 Mt of iron ore in 2015 of which 608 from Australia, 192 from Brazil, 45 from South Africa and 109 from other 44 countries. Mongolia is the 11th biggest exporter to China. The figure below shows iron ore quantity exported to China from 2001 through 2015. Over the last 15 years, China's import of iron ore grew at 10 times (annual growth – 17%). Mongolia shipped its first iron ore to China in 2004 and the quantity was 0.03 Mt. Since then, Mongolia's iron ore export sharply increased to 5.5-7.4 Mt during last five years and it is around 0.6% - 0.9% of China's imported volume.

FIGURE 14. IRON ORE EXPORT TO CHINA (2001–2015), MT



Source (ITC, 2016)

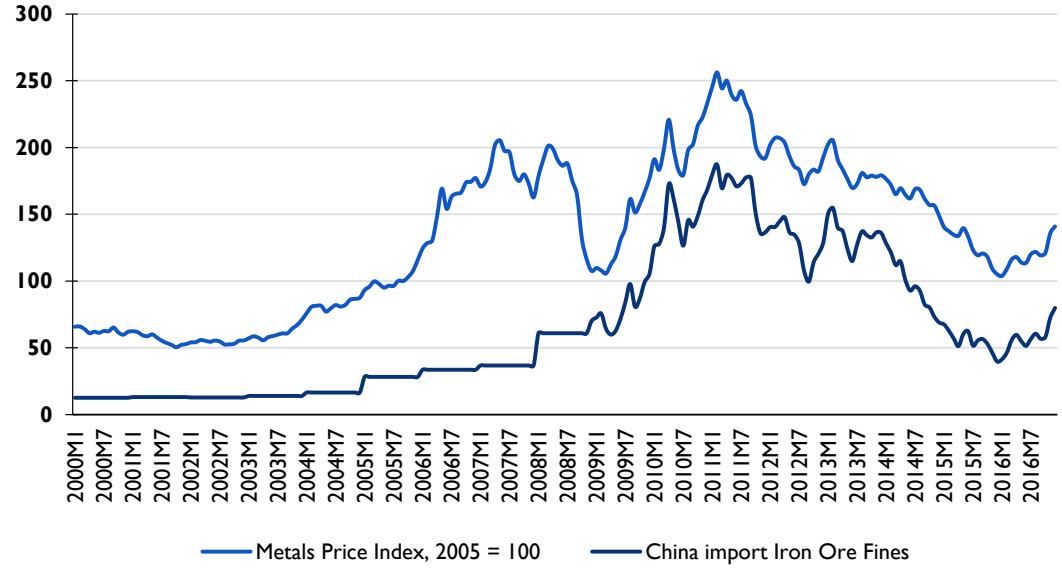
The iron ore price has been falling since 2012, therefore, import values decreased from US$126.2 billion in 2011 to an estimated US$54.2 billion in 2016. In the five years through 2016, revenue for the iron ore mining industry in China has been declining 4.1% per year on average. In 2014 and 2015, sharply falling downstream demand and iron ore prices led revenue to decline by 6.7% and 22.6%, respectively. In 2016, revenue is estimated to fall by 6.9% to US$109.1 million. (IBIS World, 2016)

Iron ore price forecasts

Demand for iron ore decreased in 2015 due to slower growth in world steel production. The weak growth in world steel production lead to a slower growth and lower price in the market for iron ore and squeezed margins for mining companies. After a long period of rapid growth, demand for iron ore shrunk and prices returned to levels of 2002. The price of iron ore was US$71.26 per dry metric ton at the beginning of 2015, but fell 39% by the end of the year. However, iron ore prices increased again to US$80 in the end of 2016

The price increase since 2000 can mainly be explained by the rapid industrial development of China and other countries, and the increasing demand for iron ore. At the beginning of 2005 the iron ore producers negotiated a sharp price increase of 71.5% from steel mills. The global financial crisis influenced the price drop from 2008, the first since the rapid price increases from 2005. Since 2010, the real price has been increasing until beginning of 2011, after which the price has been decreasing.

FIGURE 15. IRON ORE PRICES (US$/TON)



Source: Monthly Data, International Monetary Fund (Search: 2017.01.22)

Key drivers of prices

According to Ecorys (2012), the following key factors influence on iron ore price:

- Overall economic situation: Since iron ore is a main raw material of steel and thus its supply is essential to the urban development and infrastructure building in all countries, the price is heavily dependent on their economic situation.
- Economic development of the key consumer-states: In the last years China became more important and therefore the price of iron ore depends on the negotiations between the miners and the China Iron & Steel Association[3] (CISA).

[3] CISA is a national, non-profit organization founded in 1999. CISA now has nearly 120 group members. Its members are China's steel enterprises, institutions, societies and individuals in the iron and steel industry.

- Investments and innovations in the mining capacity: The price of iron ore is also linked to producers, and major investments for expansion and cost cutting measures of the leading mining companies will put pressure down on the price;
- Oligopolistic market: There are three key producers of iron ore, BHP Billiton, Rio Tinto, and Vale, who control around 50 % of the contestable market. They are expected to continue to use their pricing power to maintain relatively strong pricing from a historical context.
- Speculation on the market. Before 2010, these producers used to negotiate price with buyers on fixed one-year of longer contracts. Since then with the rise of China and growth of its steel demand, there has been a spot market, which influences the price but can also lead to market speculation. Now miners and steel mills sign on shorter (mostly monthly) index-linked contracts based on the average spot price for iron ore supplied to China (Financial Times, 2016).
- Energy costs: the price of iron ore production depends highly on transportation costs, which in turn depend on energy costs. For last years, low oil prices led to a significant reduction of the shipment cost of iron ores especially from Australian and Brazilian mines.

In the study of Ecorys (2012), the real prices of iron ore are highly volatile. The lowest volatility has been between 1991-2000, while the highest one has been between 2000-2011. This is also explained by above mentioned factors. In the future, market prices are expected to be more volatile due to the new spot market-linked pricing mechanism and emerging speculation effects.

Future trend

In February 2016, to strengthen its climate targets, the State Council of China issued guidelines that ordered steel production capacity to be reduced by 100-150 Mt in the next five years, with cuts of 45 Mt in 2016. But iron ore and steel have risen after a revival in the property market. Home sales jumped by 71% in March, and investment in real-estate development rose in the first quarter of 2016. According to Business Intelligence (Bloomberg, 2016), more than 60% of sharp increase in iron ore price in 2016 is mainly due to a recovery in China's steel demand (construction sector) and delays to several supply projects such as Samarco in Brazil (Vale), Simandou in Guinea (Rio Tinto) etc.,

Some price projections:

- Iron ore forecasts for the next five years through 2020 have been revised to be higher by the World Bank after the commodity rallied in the first quarter following a surge in steel prices in China, the largest user. Specifically, iron ore price is projected to be US$ 55 per ton in 2017 to aUS$ 56.2 in 2020 (World Bank, 2017)
- Morgan Stanley expects that supply surplus is the main factor of the price decline and estimates that the surplus will be 87 Mt in 2016, 116 Mt in 2017, and 156 Mt in 2018. Therefore, iron ore price will be around US$ 58 in the next two years. (Bloomberg TV Mongolia, 2016)
- Custeel, an integrated metallurgical website led by CISA, projected that average price of iron ore will be US$ 60-65 per ton in 2017. Even though the financial feature of iron ore is improving, this market is expected to have more frequent fluctuations. The highest price may appear during first half of 2017. After the restoration of iron ore supply, prices will drop back in the second half of 2017 (Umetal, 2016).
- According to UNCTAD (2016), an estimated 109 Mt per year of iron ore capacity was added in 2015, and it identifies 115-236 Mt of new mining capacity coming on

stream by the end of 2018. Some closures will take place but UNCTAD expects a net addition to iron ore mining capacity over the three-year period.

- Bloomberg predicts that, in the short-term, the world iron ore market will be characterized by oversupply. This will prevent prices from rising to a peak level and they will be determined by additional investments, particularly by mining giants. However, using an optimistic 2% long-term growth rate in Chinese demand, the global iron ore market may reach a 50 Mt deficit by 2020, according to a Business Intelligence study on company schedules of new mine supply.

Conclusion

Since 2000, especially during the period of 2009-2011, iron ore prices had been increased dramatically, but after that the price has dropped. This rapid change in price was determined by two main forces. On the demand side, industrial developments in China and other emerging economies play the main role. Actually, the global commodity price increase in the 2000s was the result of increasing steel demand in infrastructure and construction sectors. On the supply side, many large-scale projects started in the world wide, especially in Western Australia and Brazil, after commodity price took-off. As a result, global iron ore supply exceeds global demand in recent years.

Iron ore demand will grow moderately in the long run because China transit from the investment led fast growing economy to the consumption led slower growing economy. In contrast, the demand for the commodity in other emerging markets such as India and ASEAN will grow dramatically mainly because their process of urbanization and industrialization will be highly steel intensive. Recycling steel is an important factor that decreases iron ore demand. The scrap supply will continue to grow in future. Another factor that decreases iron ore demand is technological advance in steel making.

Mongolia is rich in iron ore but most deposits are small and far from the main rail road. Mining of iron ore was started in 2005. Since 2011, 6 Mt of iron ore on average has been exported annually to China. In 2013, iron ore export reached a record level, 15% of total export of Mongolia, but since then the amount of export decreased because of the fall in the world price and the decline in the production. In 2016, the share of iron ore export in total export was 5%. As price slumps, most local iron ore mining companies halted their operations. Only the biggest mining company, Bold Tumur Eroo Gol, does continue its operation in 2016 by taking advantage of railroad connection. The company exports its iron concentrated ore to Bugat steel making plant, China. However, Ulaanbaatar Railway, as a natural monopoly in Mongolia, charges relatively high tariff on iron shipment.

There is an interest among iron ore miners to process iron ore and produce steel domestically, but building steel making plant is considered to be inefficient due to local consumption of steel is much lower than the efficient capacity, export standard is high, and regional competition is intense.

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Appendices

Table A1. Crude steel production (million tons)

Country	1980	2000	2008	2009	2010	2011	2012	2013	2014	2015*
World	716.4	850.1	1326.5	1,219.7	1,413.6	1,490.1	1552.9	1649.3	1670.1	1620.9
China	37.1	128.5	500.3	573.6	626.7	683.3	724.7	779.0	822.7	803.8
Japan	111.4	106.4	118.7	87.5	109.6	107.6	107.2	110.6	110.7	105.2
India	9.5	26.9	57.8	62.8	68.3	72.2	77.3	81.2	87.3	89.4
United States	101.4	101.8	91.4	58.2	80.6	86.2	88.6	87.0	88.2	78.8
Russia	n/a	59.1	68.5	60.0	66.9	68.7	70.6	69.4	71.5	70.9
South Korea	8.5	43.1	53.6	48.6	58.5	68.5	69.3	66.0	71.5	69.7
Germany	51.1	46.4	45.8	32.7	43.8	44.3	42.7	42.6	42.9	42.7
Brazil	15.3	27.9	33.7	26.5	32.8	35.2	34.7	34.2	33.9	33.3
Turkey	2.5	14.3	26.8	25.3	29.0	34.1	35.9	34.7	34.0	31.5
Ukraine	52.4	31.8	37.3	29.9	33.6	35.3	32.9	32.8	27.2	23.0
Italy	26.5	26.8	30.6	19.7	25.8	28.7	27.2	24.1	23.7	22.0
Mexico	7.1	15.6	17.2	14.2	17.0	18.1	18.1	18.2	19.0	18.2
Iran	0.5	6.6	10.0	10.9	12.0	13.0	14.5	15.4	16.3	16.1
France	23.1	20.9	17.9	12.8	15.4	15.8	15.6	15.7	16.1	15.0
Spain	12.8	15.9	18.6	14.3	16.3	15.6	13.6	13.7	14.3	14.8
Canada	15.9	16.6	14.8	9.0	13.0	13.1	13.5	12.4	12.7	12.5
United Kingdom	11.3	15.2	13.5	10.1	9.7	9.5	9.6	11.9	12.1	10.9
Poland	19.5	10.5	9.7	7.2	8.0	8.8	8.4	8.0	8.6	9.2
Austria	4.6	5.7	7.6	5.7	7.2	7.5	7.4	7.9	7.9	7.7
Belgium	12.3	11.6	10.7	5.6	8.1	8.1	7.4	7.1	7.3	7.2
Netherlands	5.3	5.7	6.8	5.2	6.7	6.9	6.9	6.7	6.0	7.0
South Africa	9.1	8.5	8.3	7.5	8.5	6.7	7.1	7.2	6.6	6.4
Vietnam	0.1	0.3	2.7	2.7	2.7	4.9	5.3	5.6	5.9	6.1
Egypt	1.0	2.8	6.2	5.5	6.7	6.5	6.6	6.8	6.5	5.5
Saudi Arabia	0.1	3.0	4.7	4.7	5.0	5.3	5.2	5.4	6.3	5.3
Czech Republic	n/a	6.2	6.4	4.6	5.2	5.6	5.1	5.2	5.4	5.3
Argentina	2.7	4.5	5.5	4.0	5.1	5.7	5.0	5.2	5.5	5.0
Australia	7.6	7.1	7.6	5.2	7.3	6.4	4.9	4.7	4.6	4.9
Slovakia	n/a	3.7	4.5	3.7	4.6	4.2	4.4	4.5	4.7	4.6
Sweden	4.2	5.2	5.2	2.8	4.8	4.9	4.3	4.4	4.5	4.4
Indonesia	0.5	2.8	3.9	3.5	3.6	3.6	2.3	2.6	4.4	4.2
Malaysia	0.2	3.7	6.4	4.0	4.1	5.9	5.6	4.7	4.3	4.1
Finland	2.5	4.1	4.4	3.1	4.0	4.0	3.8	3.5	3.8	4.0
Kazakhstan	n/a	4.8	4.3	4.1	4.3	4.7	3.9	3.3	3.7	3.9
Thailand	0.45	2.1	5.2	3.6	3.7	4.2	3.3	3.6	4.1	3.7

Romania	13.2	4.7	5.0	2.7	3.9	3.8	3.3	3.0	3.2	3.4
United Arab Emirates	0.5	0.1	0.1	0.2	0.5	2.0	2.4	2.9	2.4	3.0
Qatar	0.46	0.7	1.4	1.4	2.0	2.0	2.1	2.2	3.0	2.6
Pakistan	0.04	1.0	2.0	1.2	1.4	1.6	1.6	1.9	2.4	2.9
Belarus	n/a	1.5	2.6	2.4	2.5	2.6	2.7	2.2	2.5	2.5
Luxembourg	4.6	2.6	2.6	2.1	2.5	2.5	2.2	2.1	2.2	2.1
Others	n/a	n/a	28.6 (est.)	23.3 (est.)	26.5 (est.)	29.9	29.5	28.4	26.3	26.9

Source: (World Steel Association, 2016)

TABLE A2. TOP IRON ORE IMPORTERS

	Quantity imported in 2015, Mt	Value imported in 2015 (US$ bln)	Unit value (US$/ton)	Annual growth in quantity, 2011-15
World	1 419.8	90.3	64	7%
China	953.2	57.9	61	9%
Japan	131.0	9.3	71	1%
South Korea	73.3	4.9	67	4%
Germany	41.4	2.8	66	1%
Taipei	23.8	1.6	66	5%
France	16.4	0.9	54	6%
Malaysia	14.7	0.6	39	41%
United Kingdom	12.0	0.8	63	10%
Oman	10.6	0.4	41	56%
Turkey	10.0	0.8	80	9%

Source: (ITC, 2016)

TABLE A3. TOP IRON ORE EXPORTER

Economies	Quantity exported in 2015, Mt	Value exported in 2015 (US$ bln)	Unit value (US$/ton)	Annual growth in quantity, 2011-15
World	1 424.1	67.3	47	7%
Australia	768.3	36.8	48	16%
Brazil	366.2	14.1	38	3%
Ukraine	45.7	2.1	46	8%
South Africa	41.7	2.7	64	-5%
Canada	37.2	2.8	75	3%
Russia	21.3	1.0	48	-6%
Sweden	20.1	1.6	78	-1%
Chile	14.1	0.7	51	9%
Malaysia	13.3	0.5	39	22%
Iran	13.2	0.7	53	-2%
Mauritania	11.2	0.6	54	6%
Peru	11.2	0.4	31	4%

Source: (ITC, 2016)