EXPORT-IMPORT BANK OF INDIA

OCCASIONAL PAPER NO. 172

INDIAN STEEL INDUSTRY: EXPORT PROSPECTS

CONTENTS

Project Team :

Mr. Ashish Kumar, Assistant General Manager, Research and Analysis Group
Mr. Rahul Mazumdar, Chief Manager, Research and Analysis Group
Ms. Jahanwi, Manager, Research and Analysis Group

LIST OF TABLES

LIST OF EXHIBITS

EXECUTIVE SUMMARY

OVERVIEW

Steel industry is often considered as the backbone of the economy, depicting the development and performance of the overall economy. A period of industrial growth is typically matched by prosperity in the iron and steel sector; similarly, industrial sluggishness gets captured in contraction in demand for iron and steel, resulting in a phase of stagnation for the industry.

Increasing modernization in the twenty-first century has led to a doubling of global steel production from 851 MT (million tons) at the turn of the century in 2000 to 1,662 MT in 2014. According to World Steel Association, the global steel demand, measured in terms of apparent steel use, which is defined as deliveries of steel goods plus net direct imports of steel goods, is estimated to have touched 1537 MT in 2014. The past growth in steel has largely been at the backdrop of heightened economic activity in the emerging economies, particularly China, whose demand remains a pivotal factor driving the global steel industry.

The steel industry in India has also witnessed a rapid rise in production over the past few years at the backdrop of enhancement of capacity. This has resulted in India becoming the fourth largest producer of crude steel (after China, Japan, and USA) and the largest producer of sponge iron in the world. However, the industry witnessed a sharp decline in capacity utilisation to 77 per cent in 2013-14 from a high of 91 per cent in 2010-11, primarily due to shortage of iron ore. Notwithstanding this, the steel sector in India accounts for about 2 per cent of India's GDP and holds a 6 per cent share in the industrial production of the country. With construction and infrastructure sectors together occupying a significant share in total steel demand in India, the revival of these sectors are expected to cause a positive effect on the domestic steel industry.

GLOBAL STEEL: AN INSIGHT

Asia and the Middle East remained the most vibrant regions in terms of production, with a CAGR of 7.1 per cent and 7.0 per cent, respectively, over the last decade (2005-2014), in crude steel as compared to 4 per cent for the world as a whole. However, regions like EU, Africa and North America exhibited contraction, registering negative CAGRs of 1.6 per cent, 1.2 per cent, and 0.6 per cent, repsectively. Production in other parts of the world remained either stagnant or registered a decline.

At the country level, China remained by far, the largest producer of crude steel accounting for nearly half of the world's steel production in 2014. The country also recorded the highest growth in production levels among the major producers with output increasing from 355.8 MT in 2005 to 822.7 MT in 2014 (CAGR of 9.8 per cent). The only other major producer to witness such dynamism was India, which recorded a CAGR of 6.9 per cent - increasing its production from 45.8 MT to 83.2 MT during the same period.

The top 10 exporters of steel in the world occupied a share of 58 per cent in 2013. Global steel exports registered a CAGR of 5.1 per cent during 2004 and 2013, with the largest exporter of steel – China recording a brisk CAGR of 14.4 per cent during this period. The other major exporters include Japan, Germany, South Korea and Russia.

As demand for steel weakened and a huge overcapacity hovered over the global steel industry, raw material prices eased. The global composite carbon steel prices, which stood at US$ 686/tonne in June 2013 and had touched a peak at US$ 726/tonne in January 2014, plunged to US$ 592/tonne in February 2015, owing to a demand-supply mismatch. This was the ninth consecutive decline in global steel prices since May 2014. Iron-ore prices on the other hand stood at US$ 60.2 per dry metric tonne (as on May 2015) as compared to US$ 100.5 per dry metric tonne a year ago. In fact, prices have dipped significantly since May 2010 when they hovered around US$ 161.35 per dry metric tonne.

With the dynamics in steel industry and increasing competition, new trends in the industry are being witnessed from product development, technology development, accident free and sustainable steel, to having a life-cycle assessment.

INDIAN SCENARIO

The Indian steel sector was the first core sector to be completely freed from the licensing regime. Since 1991, the sector has witnessed consistent reforms including elimination of pricing and distribution controls.

Crude steel production in India amounted to 81.54 MT in 2013-14, registering a growth of 4.0 percent as compared to the previous year. The production for sale of total finished steel (alloy and non-alloy) in the country stood at 85.05 MT in 2013-14 as compared to 14.23 MT in 1991-92 – an increase of nearly 6 times. The total production for sale of pig iron was 7.29 MT in 2013-14 as compared to 1.59 MT in 1991-92. In the case of DRI (direct reduced iron), India is one of the largest producers in the world. From a mere 1.31 million tonnes of production in 1991-92, India's DRI production reached 14.97 million tonnes in 2013-14 after touching a high of 25.08 million tonnes in 2010-11. The category-wise production of pig iron and finished steel in India during the period 2013- 14 shows that rods/ bars and HR Coils/Strips were the largest produced categories, with shares of 35 per cent and 23 per cent, respectively.

On account of the steady growth in the domestic steel consumption, India became the third largest consumer of steel globally in 2009, and continued to remain so as on 2014. China was the largest consumer with a consumption of 711 MT in 2014.

Among end-user sectors, infrastructure and industrial construction together continued to account for about 40 per cent of India's total steel consumption in 2013-14, followed by automobiles (12 per cent) and the pipes & tubes industry (9 per cent). Category-wise real consumption of total finished steel was led by non-flat steel (41.28 MT), which recorded a growth rate of 2.6 per cent on year on year basis, while growth rate declined for flat steel consumption (32.61 MT) by 2.0 per cent during 2013-14. This was also reflected in the respective shares, with the share of flat steel in total consumption (44 per cent) dropping marginally in 2013-14, accompanied by a gain in the share of long/non flat steel (56 per cent) during the year as compared to the last year.

In terms of value, India's exports of iron and steel in the year 2008-09 was valued at US$ 13.3 billion, and India's imports of iron and steel were valued at US$ 13.9 billion, leading to a trade deficit of US$ 0.6 billion under this category. After having witnessed a trade deficit for a number of years, in 2013-14 India displayed a trade

surplus in iron and steel, with exports amounting to US$ 16.0 bn and imports amounting to US$ 12.7 bn. However, in 2014-15, India exhibited a marginal trade deficit of US$ 35 mn in iron and steel (Table 13).

India's export markets for steel are well diversified and less concentrated as compared to imports. While India's exports of iron & steel (HS Code 72) during 2003-04 was hugely concentrated in China, the share declined drastically in 2014-15. Unlike 2003-04, India's exports of iron and steel (HS code 72) seemed quite diversified across regions and countries in 2014-15. However, India's exports of articles of iron and steel (HS code 73) remained concentrated within USA and UAE, both during 2003-04 and 2014-15, with their cumulative shares being 34.7 per cent in 2003-04 and 31.7 per cent in 2014-15.

PRODUCT AND MARKET IDENTIFICATION OF STEEL PRODUCTS

This chapter provides an analysis of iron and steel products and markets where the country has demonstrated comparative advantage. Quantification of comparative advantage over a period of time will help in understanding the markets and products where India has been performing well, as well as identifying the areas where producers have lost ground and success has been limited. This will be a necessary first step towards identification of areas where Indian companies could potentially expand their presence.

An attempt has been made to map the global demand for iron and steel products with India's export competitiveness, with a view to outlining a market specific approach for exporters. A generic analysis has been attempted in order to identify products that have strong capabilities to export. Also analyzed are the current export markets where India has penetrated and the key competitors which India faces. While India needs to further consolidate its share in the major import markets, there are markets where India already has export competitiveness, but its imports are at relatively lower levels. These markets are the potential growth drivers for India's iron and steel exports and need to be suitably targeted.

At the aggregate level, the markets of North America, Latin America, Asia and Oceania are regions where Indian Iron and Steel products are competitive, and these regions have

also exhibited strong import demand for the products. In Europe and Africa, Indian Iron and Steel products are competitive, but the growth in import demand has been frail, which puts forward a case for Indian exporters currently exporting to these regions, to diversify into other regions which have shown higher import demand.

Product Champions have been identified at the regional level. These have the maximum potential, as the regional import demand in these products has shown robust AAGR over the period 2008-2012, while India's exports of these products to the region are competitive, and the competitiveness has remained same or increased over the period under consideration. The identified product champions are 'Stainless Steel' in Africa and Europe; 'Stainless Steel' and 'Primary Materials; Products in Granular or Powder Form' in Latin America; and 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)', 'Tubes, Pipes and Hollow Profiles', 'Iron and Non-Alloy Steel', and 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel' in Oceania. There were no true product champions in the case of India's exports to Asia and North America.

THE INDIAN STEEL INDUSTRY: STRATEGIES

Raw materials security is on the top of the agenda. India is very dependent on imported coking coal. Approximately 60 – 65 per cent of the domestic coking coal requirements are met through imports due to unavailability of appropriate qualities in the country. As companies look to secure their raw materials supplies, the capability to acquire, develop and operate overseas raw material assets has become a strategic imperative given the short term challenges in securing such assets in India.

The comprehensive economic partnership agreement (CEPA) with South Korea has resulted in increase in imports of iron and steel. With the conclusion of the India-Japan FTA in 2011, India faces a similar threat of imports from Japan. Companies have to bring to the notice of the policymakers about the various pitfalls of such trade agreements, and hence necessary attention is required during such deals.

Given the fact that steel market across the globe is vulnerable to global conditions, India needs to be more proactive in diversifying its export

markets. India could therefore adopt a similar strategy as Brazil, focusing on geographically nearer markets where it has a freight advantage, such as Nepal, Bangladesh and Sri Lanka. At the same time, Indian companies could be more successful in other important and growing export destinations for steel sheet products, including the Middle East and Africa, where they have a freight advantage over China, Japan and South Korea.

To ensure competitive advantage, steel makers need to concentrate on reducing costs especially operating costs, need to be brought down by adopting strict cost control measures and through benchmarking. Another major cost that needs to be looked into is the cost of raw material. The only way to reduce costs on these is using raw materials more efficiently, which can bring significant cost savings.

Among other crucial aspects which the Government may look into to help establish sustainable growth for the steel industry are streamlining land acquisition and environmental regulations, augmenting infrastructure and logistic facilities, discouraging the exports of iron-ore from India given India's domestic needs, reducing procedural delays, and encouraging futures market for steel products.

Firms, on the other hand, need to introduce new product lines in accordance with the needs of specific markets, be abreast of the competition they face from substitutes, enhance recycling of steel in the country, while raising the manufacturing facilities in the steel plants to global standards.

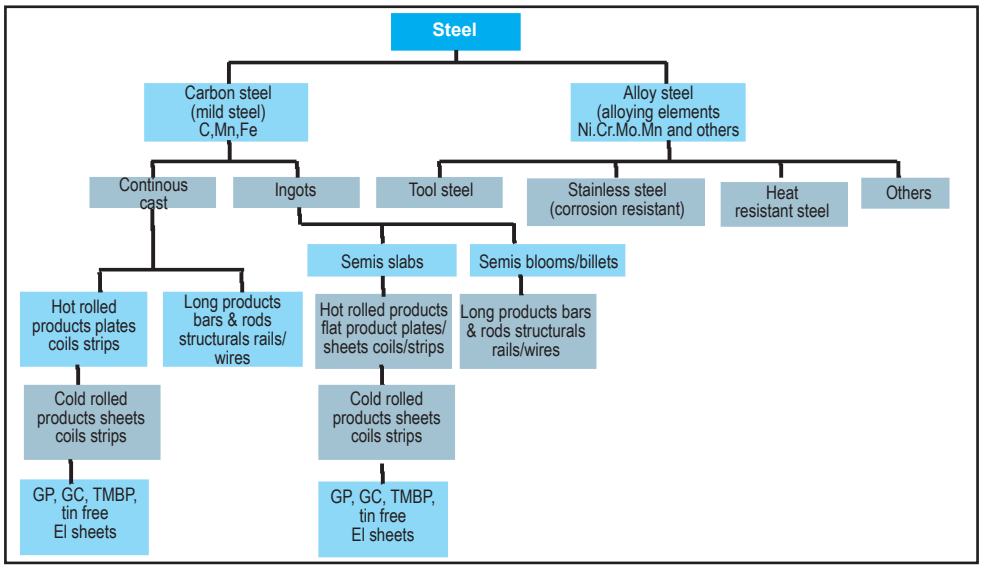
1. INTRODUCTION

Steel industry is the pulse of an economy, and depicts the direction in which the overall economy is heading. The industry essentially measures the economic progress of the country or region. This is largely because of the manifold usage it has in numerous end user industries, including infrastructure which is a key consumer of steel.

1.1 Steel Classification

Steel is an alloy of iron and carbon containing less than 2 per cent carbon and 1 per cent manganese and small amounts of silicon, phosphorus, sulphur and oxygen. Steel manufacturers primarily produce three types of products: flat products, long products and alloy steel.

Exhibit 1: Various Types of Steel in Market



HR : Hot Rolled
CR : Cold Rolled
GP : Galvanised Plain
GC : Galvanised Coil
TMBP : Tin Mill Black Plate

Flat steel is typically made by rolling steel through sets of rollers to achieve the final thickness. Finished flat steel products are produced from slabs in rolling mills, using flat rolls. These are produced in hot rolled (HR), cold rolled (CR) or coated condition.

- Plate products: Vary in thickness from 10-200 mm. Plate products are used for shipbuilding, construction, large diameter welded pipes and boiler applications.

- Strip products: These may be hot rolled (HR) or cold rolled (CR) and vary in thickness from 1-10 mm. Strip products are used in automotive body panels, domestic white goods, steel (or tin) cans, and products ranging from office furniture to heart pacemakers.

Long products are mainly used in the construction industry. Long products come out of the mill as long bars of steel. Long steel is produced in a wide range of shapes and sizes. These can have cross-sections shaped like a H or I (called joists, beams and columns), a U (channels), or a T (sections). Thus, a long product can be a rod, a bar or a section. Blooms and billets (which are semi-finished products) are mostly used to roll long products. Billets are smaller than blooms, and are therefore used for smaller type of long products.

- Typical rod products are reinforcing rods used in concrete, engineering products, gears, tools, etc.

- Typical bar products can have cross-sections in the shape of squares, rectangles, circles, hexagons, angles, etc. These bars can also be used for construction, and are used largely for engineering purposes.

- Sections are large rolled steel joists (RSJ) that are used in building projects. Wire-drawn products and seamless pipes are also part of the long products group.

Alloy steel comes in different grades, which have varying proportions of carbon and other elements. These elements determine the property of the steel. Different types of alloy steel have different applications. For instance, hard abrasion-resistant steel is used to make industrial tools; heat-resistant steel is used in high-temperature applications; and fatigue-resistant steel is meant for mechanical applications. The composition of alloy steel depends upon its intended application and cannot be generalised as a single commodity, i.e. it cannot be categorised as in the case of HR and

CR sheets, etc. Although this category consists of high-value steel alloys, volumes of this segment are very low as compared with those of the carbon steel products. The most widely used alloy steel is stainless steel. It is a corrosion-resistant metal and contains chromium and nickel as major alloying elements.

1.2 Steel Production

There are two main ways in which steel is produced:

- **Iron ore-based steelmaking** accounts for about 70 per cent of world steel production. Iron ore is reduced to iron and then converted to steel. The main inputs are iron ore, coal, limestone and recycled (scrap) steel. The main ore-based production routes are: ironmaking via the blast furnace (BF) followed by steelmaking in the basic oxygen furnace (BOF), and ironmaking via direct reduction (DRI) followed by steelmaking in the electric arc furnace (EAF).

- **Scrap-based steel** accounts for about 30 per cent of global steel production. It is produced by recycling steel in an EAF. The main inputs are recycled steel and electricity. Depending on the plant configuration and availability of recycled steel, other sources of metallic iron such as direct-reduced iron (DRI) or hot metal can also be used in the EAF route.

The main by-products produced during iron and crude steel production are slags (90 per cent by mass), dusts and sludges. Process gases, for example, from the coke oven, BF or BOF are also important by-products.

On average the production of one tonne of steel results in 200 kg (EAF) to 400 kg (BF/BOF) of by-products.

1.3 Application

The wide range of application makes steel the most important ingredient for manufacturing and other industrial activities. Usually a period of industrial growth is matched by prosperity in the iron and steel sector; similarly, industrial sluggishness gets captured in contraction in demand for iron and steel, resulting in a phase of stagnation for the industry. Hence the performance of steel industry hinges upon the performance of the application and end-user industries.

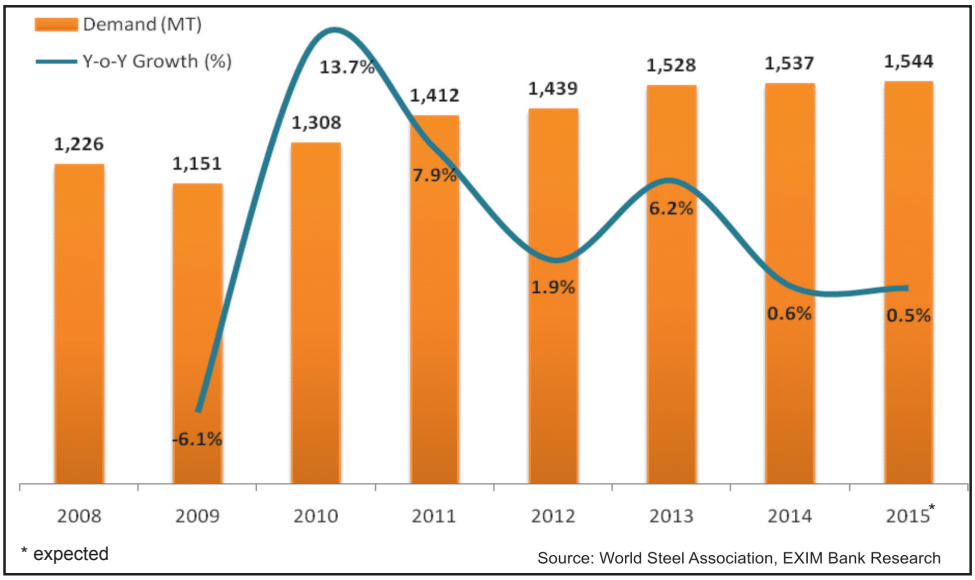
1.4 Progress of Steel Globally

In terms of growth in production, increasing modernization in the 21st century has led to a doubling of global steel production from 851 MT (million tons) at the turn of the century

Table 1: Applications of Steel Products

Products	Applications
HR coils	Pipes, tubes, strapping materials, telecom poles, streetlight poles, lancing tubes, wheels, industrial & auto chain etc.
HR sheets	Wagon/ coach building, automobile, agricultural implements, LPG cylinders, defense equipment, general engineering/fabrication etc.
CR coils/sheets	Automobile components, bicycle components, barrels, furniture/office equipment, precision tubes, instrument panels, refrigerators, railway coaches/locomotives etc.
GP/GC sheets/ coils	Roofing, panelling, industrial sheds, air conditioning, containers, agricultural implements, rolling shutters etc.
Plates	Shipbuilding, pipes, tanks, boilers, plant and machinery, railway stocks, wheels, vehicle manufacturing, etc.
Tinplates	Food and other containers, beverage cans, kitchen utensils, radio components etc.
Electrical sheets	Power transformers, generators, rotating equipment, motors for washing machines, furnace blowers, fans, etc.
Wire rods	Bolts, nuts, screws, wire netting, electrodes, wire mesh etc
Bars	General concrete reinforcement in buildings, bridges etc.
Rounds	General engineering, bright bar
Structural items	General engineering, construction, fabrication, transformer poles, fencing angles, etc.

Exhibit 2 : Global Apparent Steel Demand (2008 - 2015)



in 2000 to 1,662 MT in 2014. The size notwithstanding, the industry remains relatively fragmented. It is also highly cyclical and intensely competitive.

The global economic activity is perceived to improve in 2015–16, largely because of the lower oil prices. IMF has estimated the global growth to be 3.3 per cent in 2014. Growth for 2015 and 2016 are projected to be 3.5 per cent, and 3.7 per cent respectively. However, the possible downward revisions to growth forecasts in select economies highlight continued fragilities. In advanced economies, output gaps generally remain large. In many emerging market and developing economies, stronger external demand from advanced economies is expected to be crucial to lift growth, although domestic weaknesses continues to remain a concern.

The continuing Euro-zone difficulties, slow/flat growth in developed economies, and a cooling of emerging economies has taken a toll on the industry. Growth in the Chinese economy, which in recent years has been one of the main demand drivers for steel, slowed down. Overcapacity has also been a perennial problem. Stiff competition in the United States from domestic producers having newer or expanded facilities, as well as the threat of cheaper imports, continues to result in significant oversupply compared to demand.

The global steel demand has been increasing gradually, as evident from data compiled from 2007 onwards. While steel demand registered a decline from 1226 MT in 2008 to 1,151 MT in 2009 following the global financial crisis, it recovered since then to record a consistent increase to touch 1537 MT in 2014.

According to World Steel Association, the demand is expected to touch 1544 MT by 2015. The past growth in steel has largely been at the backdrop of heightened economic activity in the emerging economies, particularly China, and hence the demand from China remains a pivotal factor.

The world steel capacity utilization[1] in the post-crisis period has been witnessing a continuous decline, which was well below the pre-crisis level. During June 2008, capacity utilisation globally stood at 92.7 per cent, which touched a low of 59.8 per cent in December 2008. There have been fluctuations in capacity utilisation

[1]The monthly crude steel capacity utilisation ratio is calculated based on crude steel production and capacity information available at Worldsteel. The capacity information is based on publicly-available data, updated twice a year and verified through Worldsteel's membership.

during the years that followed, with capacity utilisation reaching a high of 84.4 per cent in December 2010, and a low of 72 per cent in January 2013. The crude steel capacity utilisation ratio in December 2014 stood at 72.7 per cent and was 2.4 percentage points lower than December 2013. The average capacity utilisation in 2014 was 76.7 per cent compared to 78.4 per cent in 2013.

According to World Steel Association, the global apparent steel use (which is defined as deliveries of steel goods plus net direct imports of steel goods), is estimated to have increased 0.6 per cent to 1,537 million tonnes in 2014 following growth of 6.2 per cent in 2013. Steel demand is projected to grow in the U.S. on the back of an improving global economy and strong momentum in the automotive markets. After years of strong demand, China's steel usage is however expected to lose steam due to the Government's ongoing attempt to restructure the economy, focusing on domestic consumption instead of exports. While steel production is expected to grow at a slow pace, a slowdown in the real estate market and weaker infrastructure investment growth are likely to weaken Chinese steel demand.

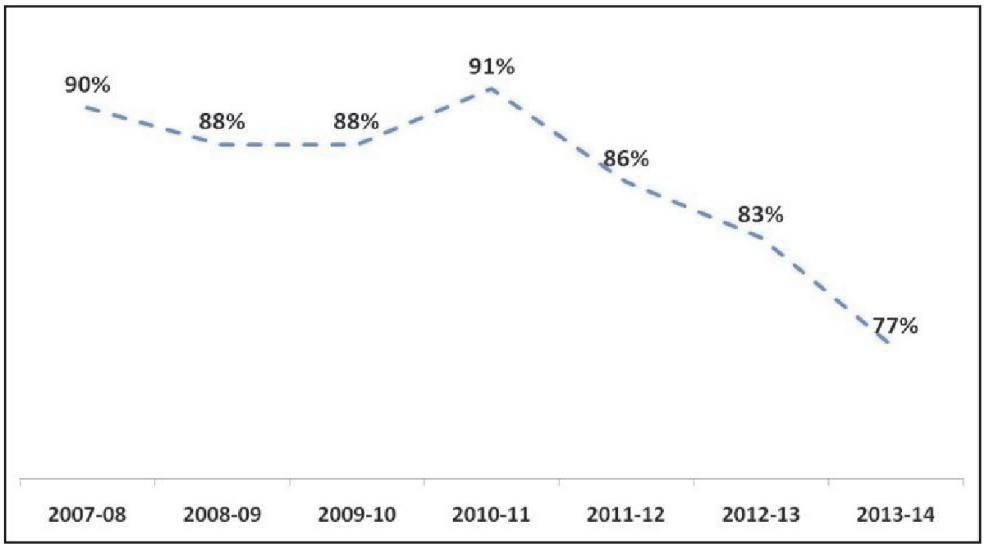
As per the latest data available from the World Steel Association, world crude steel production reached 1,662 MT for the year 2014, up by 0.8 per cent compared to 2013.

- In 2014, the Middle East, the smallest region for crude steel production had the most robust growth. Crude steel production in the EU (28), North America and Asia grew modestly in 2014 compared to 2013, while in the C.I.S. and South America it decreased.

- Annual production for Asia was 1,132.3 MT of crude steel in 2014, an increase of 1.4 per cent compared to 2013. China's crude steel production in 2014 reached 822.7 MT, an increase of 0.1 per cent on 2013. China's share of world crude steel production decreased from 49.8 per cent in 2013 to 49.5 per cent in 2014. Japan produced 110.7 MT in 2014, a 0.2 per cent increase from 2013. South Korea's crude steel production was 71.0 MT, an increase of 7.6 per cent compared to 2013.

- The EU recorded an increase of 1.7 per cent compared to 2013, producing 169.2 MT of crude steel in 2014. Germany produced 42.9 MT of crude steel in 2014, up by 0.7 per cent over 2013. Italy produced 23.7 MT in 2014, a (-)1.4 per cent decrease over 2013. France's crude steel production

Exhibit 3: India's Steel Industry Capacity Utilisation



Source: Joint Plant Committee

in 2014 was 16.1 MT, an increase of 2.9 per cent. Spain produced 14.2 MT of crude steel in 2013, a decrease of (-)0.6 per cent compared to 2013.

- In 2014, crude steel production in North America was 121.2 MT, an increase of 2.0 per cent on 2013. The US produced 88.3 MT of crude steel, up by 1.7 per cent compared to 2013.

1.5 Progress of Steel in India

The global scenario has been a prologue to the Indian market situation where steel players have started showing signs of down-cycle leading to margin compression. This is primarily due to high input costs and a weak macroeconomic environment, both globally and domestically, resulting in muted demand for steel products from the end-user industries.

The steel industry in India has seen a rapid rise in production over the past few years at the backdrop of enhancement of capacity, which has resulted in India becoming the fourth largest producer of crude steel (after China, Japan, and USA) and the largest producer of sponge iron in the world.

However, the steel industry has lately witnessed some apprehensions with regard to capacity utilisation, which registered a sharp decline to 77 per

cent due to shortage of iron ore in 2013-14 from a high of 91 per cent in 2010-11.

Project commissioning in the Indian steel industry also showed a slow down in 2013-14. Only 3.4 million tonnes of finished steel manufacturing capacity is estimated to have been commissioned during the year. The pace of capacity additions is expected to have improved in 2014-15 with improved economic conditions. The industry is expected to add finished steel manufacturing capacity of around 11 million tonnes at a cost of Rs. 641.5 billion during the year 2014-15[2]. Most of these capacities were earlier scheduled for commissioning in 2013-14. However, owing to issues such as high cost of funding, cost over-runs, land acquisition delays, regulatory issues, absence of assured supply of raw material and other operational issues, the commissioning of these projects has been delayed.

As far as prices are concerned, steel prices are generally volatile owing to the highly cyclical nature of the global steel industry. Rising raw material prices have a direct impact on steel prices. Furthermore, overcapacity, glut in cheaper Chinese steel imports, overall economic conditions, and shifts toward other substitutes, have significantly impacted steel prices. The supply of steel due to imports from China in the market outstripped demand. Added to this, the situation in Europe and tempering growth in Asia, have kept prices in check. The lower steel prices have affected margins of major steelmakers. It is however, believed that the recovery in pricing momentum will be driven by a reviving domestic economy, stabilization in the Euro-zone, and a rebound in construction activity.

While the rupee has stabilized at a new low of around 61-63, a weak rupee could lead to increase in coking coal costs for domestic steel majors like SAIL and JSW which are dependent on imports. For companies with higher forex debt like JSW Steel, and Tata Steel, it could also lead to higher net debt.

Over a longer term for the steel industry, volume growth however would be critical, given that substantial fresh capacities are likely to be commissioned in the next two years. Unless demand conditions improve significantly, overall capacity utilisation levels and profitability of steel players would remain impacted.

[2] Crisil Research

SUM UP

While the economic scenario across the world seems to bottom out, challenges remain for global steelmakers to operate in such trying environment, with uncertainty in demand and volatile raw material prices. With continuing weak market conditions, cost reduction activities are essential for steelmakers' sustainability and future growth. While China is facing excess capacity in steel production resulting in depressed prices, India faces issues of land acquisition and capacity utilisation, among others.

However, the most promising aspect of the steel industry in India is its potential. India has already emerged as the 4th largest steel producing nation in the world. The steel sector in India accounts for about 2 per cent of India's GDP and holds a 6 per cent share in the industrial production. With the construction and infrastructure sectors together occupying a significant share in total steel demand in the country, the revival of these sectors are poised to cause a positive effect on the revival of the domestic steel industry. The urban population increase worldwide, and in India in particular, will also augment the need for building skyscrapers and public-transport infrastructure, pushing steel demand. Emerging economies like India will continue to be major drivers of demand due to the huge amount of steel required for urbanization and industrialization.

The demand for steel is thus expected to remain strong in the years to come, and hence the need for Indian steel industry to address the impending challenges, so as to be better equipped, to cater to both the domestic and overseas demand. This will also facilitate reduction in the trade deficit in steel, leading to import substitution.

This paper briefly reviews trends in the global and Indian steel market and identifies export potential of Indian steel products to different regions of the world. Also discussed are select strategies of the Indian steel industry, especially from the perspective of international trade. The silver lining in the present circumstance is the fact that developing countries have strong fundamentals for steel demand growth with emerging countries like China, India and Brazil, and select countries in Africa and South Asia holding the key to fuel future growth of the steel industry.

2. GLOBAL STEEL: AN INSIGHT

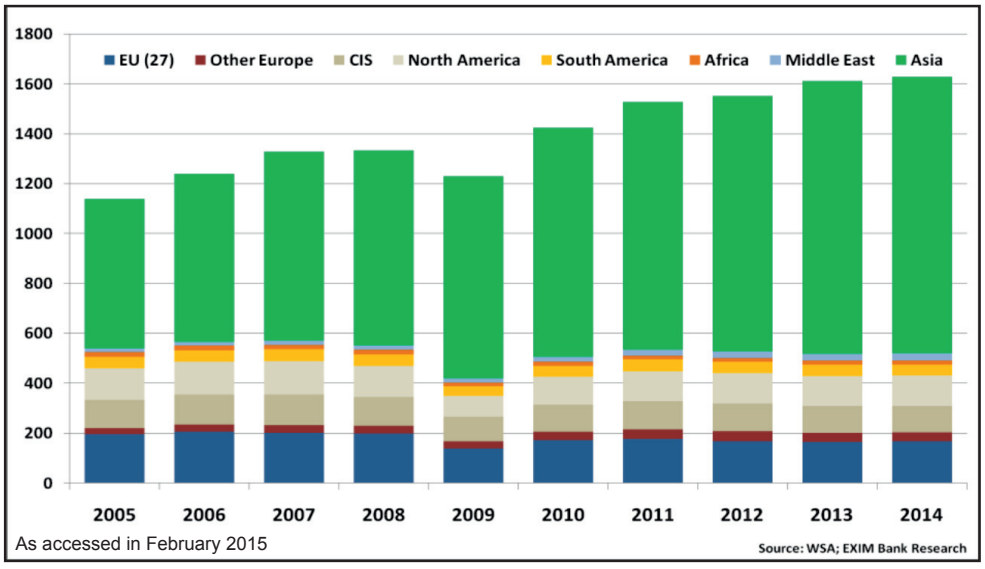
2.1 Production

Global steel production has seen a phenomenal growth over the last three decades. While it took more than 20 years for global steel production to move from 716 MT (in 1980) to breach the 850 MT mark (in 2000), it took just the next 12 years to double its production to 1662 MT in 2014.

Asia and Middle East remained the most vibrant regions in terms of production of crude steel, with a CAGR of 7.1 per cent and 7.0 per cent, respectively, over the last decade (2005-2014), as compared to 4 per cent for the world as a whole. Regions like EU, Africa and North America registered negative CAGRs of 1.6 per cent, 1.2 per cent, and 0.6 per cent. Production in other parts of the world remained either stagnant or registered a decline.

At the country level, China remained by far, the largest producer of crude steel accounting for nearly half of the world's

Exhibit 4: Trends in World Crude Steel Production (Mn Tonnes): Major Regions



As accessed in February 2015

Source: WSA; EXIM Bank Research

Table 2: Major Crude Steel Producing Countries (MT)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	CAGR (2005-14)	Share in 2014
China	355.8	421	489.7	512.3	577.1	638.7	702	716.5	821.9	822.7	9.8	49.9
Japan	112.5	116.2	120.2	118.7	87.5	109.6	107.6	107.2	110.5	110.7	-0.2	6.7
USA	94.9	98.6	98.1	91.4	58.2	80.5	86.4	88.7	86.8	88.3	-0.8	5.4
India	45.8	49.5	53.5	57.8	63.5	69	73.5	77.6	81.2	83.2	6.9	5.0
Russia	66.1	70.8	72.4	68.5	60	66.9	68.9	70.4	68.8	70.7	0.8	4.3
S. Korea	47.8	48.5	51.5	53.6	48.6	58.9	68.5	69.1	66.0	71.0	4.5	4.3
Germany	44.5	47.2	48.6	45.8	32.7	43.8	44.3	42.7	42.6	42.9	-0.4	2.6
Turkey	21	23.3	25.8	26.8	25.3	29.1	34.1	35.9	34.6	34	5.5	2.1
Brazil	31.6	30.9	33.8	33.7	26.5	32.9	35.2	34.5	34.1	33	0.5	2.0
Ukraine	38.6	40.9	42.8	37.3	29.9	33.4	35.3	33	32.7	27.2	-3.8	1.6
WORLD	**1148**	**1250**	**1348**	**1343**	**1237**	**1433**	**1537**	**1545**	**1649**	**1662**	**4.1**	**100.0**

Source: Steel Statistical Yearbook 2014, World Steel Association, as accessed in February 2015

steel production in 2014. The country also recorded the highest growth in production levels among the major producers, with output increasing from 355.8 million tonnes (MT) in 2005 to 822.7 MT in 2014 (CAGR of 9.8 per cent). The only other major producer to witness such dynamism was India, which recorded a CAGR of 6.9 per cent - increasing its production from 45.8 MT to 83.2 MT during the same period (Table 2). The world has witnessed an increasing level of concentration in crude steel production – the top 10 countries together accounted for 83.9 per cent of steel production in 2014, up from 74.8 per cent in 2005.

2.2 Major Steel Players

In the year 2013, Arcelor Mittal occupied the top spot in crude steel production, producing 96.1 million metric tonnes of steel, followed by Nippon Steel (50.1 million metric tonnes), Hebei Steel (45.8 million metric tonnes), Boasteel from China (43.9 million metric tonnes), and Wuhan and Posco (39.3 million metric tonnes each) (Table 3).

Being Asia's first integrated steel plant and India's largest integrated private sector steel company, TATA Steel of India stood at the 11th position in 2013 with a production level of 25.3 million metric tonnes. TATA Steel is also the

Table 3: Major Steel Producing Companies of the World During 2013

Rank	Company	Steel Production (In million metric tonnes)
1	ArcelorMittal	96.1
2	Nippon Steel	50.1
3	Hebei Steel	45.8
4	Baosteel	43.9
5	Wuhan	39.3
6	Posco	39.3
7	Shagang	38.4
8	Ansteel	35.1
9	Shougang	33.7
10	JFE	31.5
11	Tata Steel	25.3
26	SAIL	13.5

Source: Data Derived from World Steel Association; EXIM Bank Research

world's second most geographically diversified steel producer, with operations in over 20 countries and has commercial presence in over 50 countries. In 2013, India's public sector major SAIL occupied the 26th position in the world, with a production of 13.5 million metric tonnes.

2.3 Major Steel Exporters

The top 10 exporters of iron and steel in world (HS-72) accounted for a share of 58 per cent in 2013. The global steel exports registered a CAGR of 5.1 per cent during 2004 and 2013, with the largest exporters of steel - China (9.8 per cent share in world exports of steel in 2013) witnessing a CAGR of 14.4 per cent during the same period (Table 4). Japan was the second largest exporter with a share of 9.0 percent in global exports in 2013. Germany, South Korea and Russia were the other main exporters with shares of 7.4 per cent, 5.7 per cent, and 5.1 per cent, respectively in 2013. Amongst the top 10 exporters of iron and steel (HS-72), countries exhibiting significant increase in exports during the last decade included USA, South Korea, and the Netherlands, apart from China.

On the other hand, world exports of articles of iron or steel (HS 73) stood at US$ 310 bn in 2013, having increased from US$ 143 bn in 2004. The top 10 exporters of articles of iron or steel (HS 73) in the world constituted 61.7 per cent in 2013, with China leading with a share of 18.4%. The other top exporters in this category were Germany (10.9 percent), USA (7.1 percent), Italy (6.6 percent), Japan (4.3 percent), South Korea (3.6 percent), France (3.1 percent), Netherlands (2.7 percent), Spain (2.6 percent), and Taipei China (2.3 percent). India ranked 11th in the list of exporters, with a share of 2.4 per cent globally in 2013.

2.4 Export Orientation of Global Steel Industry

Export orientation of the world steel industry was increasing over the years, but gradually coming down, of late. The export orientation of world steel industry had increased from 22.6 per cent in 1975 to 40.8 per cent in 2000; thereafter it gradually slipped to touch 27.3 per cent in 2013.

2.5 Major Steel Importers

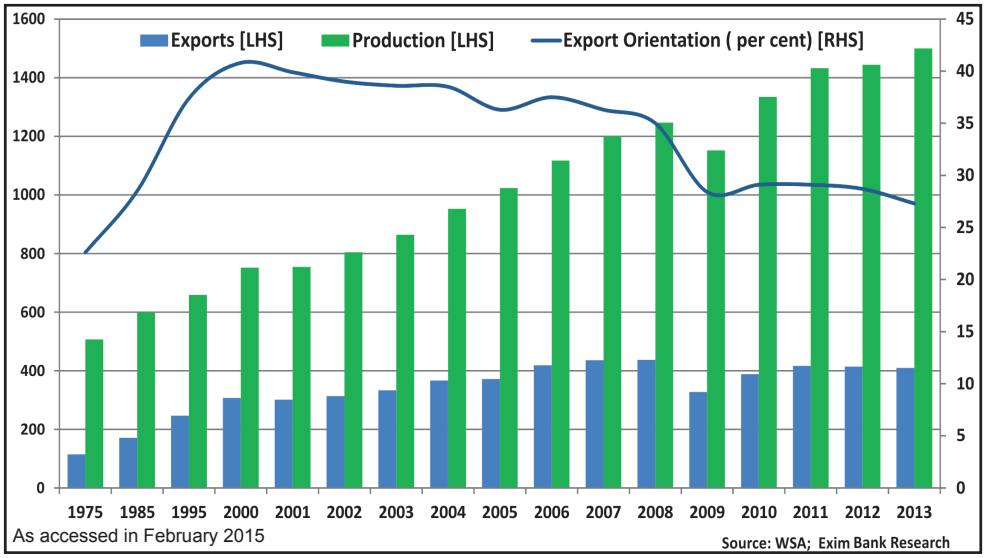
The top 10 iron and steel importing countries in the world constituted 46.5 per cent of the total world imports in 2013. China remained the largest importer of iron and steel in the world with a shares of 7.4 per cent in 2013. China was followed by Japan, Germany, South Korea and Russia, with shares of 6.7 per cent, 5.3 per

Table 4: Top Exporters of Steel (HS-72) in World (US$ bn)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	CAGR: 2004-13
China	11.5	15.1	25.1	40.0	53.5	13.5	28.9	39.9	37.1	38.6	14.4
Japan	21.2	24.4	26.0	30.1	39.2	28.4	38.9	42.2	39.5	35.3	5.8
Germany	20.5	23.6	28.5	35.7	39.3	23.3	29.4	35.6	31.4	29.1	4.0
South Korea	10.6	12.8	14.0	16.4	21.3	15.5	21.8	27.6	25.4	22.3	8.6
Russia	16.0	17.9	17.9	21.1	28.6	14.7	18.8	22.0	22.6	20.1	2.6
USA	8.9	11.3	12.6	17.1	23.8	15.4	19.8	25.3	22.8	19.7	9.2
Belgium	14.2	16.2	19.5	25.7	27.5	14.6	17.7	22.2	17.9	17.8	2.5
France	13.6	14.3	16.8	20.5	22.2	13.1	16.6	19.3	17.1	15.9	1.8
The Netherlands	7.5	8.4	11.6	14.7	15.3	11.2	16.1	19.6	16.6	14.5	7.6
Ukraine	10.8	11.5	13.1	16.7	23.0	10.3	14.6	18.5	15.3	14.3	3.2
World	**250.2**	**283.3**	**329.4**	**424.4**	**519.0**	**277.2**	**389.1**	**480.1**	**428.3**	**392.7**	**5.1**

Source: Data Derived from ITC-Trade Map; EXIM Bank Research

Exhibit 5: Export Orientation of Global Steel Industry



cent, 5.0 per cent, and 4.6 per cent, respectively.

CAGR of import demand of Russia and Belgium were the highest among the top 10 importers during the period 2004 and 2013. Russia's imports recorded a CAGR of 9.9 per cent, followed closely by Belgium which grew at 8.8 per cent. The Netherlands and Chinese imports registered CAGRs of 8 per cent and 6.3 per cent, respectively. While most other countries showed a moderate growth, Germany was the only country among the top 10 importers to record a negative CAGR in imports of (-)1.1 per cent (Table 5).

World imports of articles of iron or steel (HS 73) were largely to the developed countries– USA (with a share of 11.7 per cent), Germany (7.2 per cent), Canada and France (at 3.7 per cent each), UK (2.9 per cent), South Korea (2.7 per cent), Netherlands (2.3 per cent), and Japan (2.1 per cent). Developing countries figuring in the top 10 importers list are China with a share of 3.3 per cent, and Mexico with a share of 2.8 per cent. In terms of import growth, South Korea exhibited a significant demand at a CAGR of 21.8 per cent during 2004 and 2013. India does not figure in the list of top 10 importers of articles of iron or steel (HS 73).

PRICES

2.6 Steel Price

As demand for steel weakened and a huge overcapacity hovered over the global steel industry, raw material

Table 5: Top Importers of Steel in World (HS-72) (US$ bn)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	CAGR: 2004-13
China	17.1	21.9	26.9	35.4	40.6	21.4	29.4	38.2	31.7	29.7	6.3
Japan	24.0	23.6	30.7	27.1	33.6	13.1	22.5	29.6	30.4	27.0	1.3
Germany	23.7	26.2	20.0	23.0	24.5	27.8	25.3	28.4	23.3	21.4	-1.1
South Korea	14.1	16.4	16.9	23.1	35.8	18.4	24.9	28.4	23.8	20.4	4.2
Russia	8.0	9.5	11.5	16.2	23.2	11.3	16.1	20.4	19.6	18.7	9.9
USA	16.2	17.6	22.5	29.2	33.0	13.1	19.3	24.9	18.5	18.3	1.4
Belgium	6.4	8.4	7.1	12.2	13.5	6.9	11.0	13.1	14.0	13.7	8.8
France	12.7	13.2	15.8	19.9	22.2	11.4	14.5	18.1	14.3	13.7	0.8
The Netherlands	6.2	6.7	9.2	12.3	13.8	9.4	12.9	16.3	13.9	12.4	8.0
Ukraine	9.1	9.5	13.0	18.5	19.6	9.3	12.3	16.6	12.3	12.4	3.5
World	**264.2**	**299.6**	**339.4**	**443.2**	**545.9**	**291.8**	**395.5**	**486.7**	**438.3**	**404.0**	**4.8**

Source: Data Derived from ITC-Trade Map; EXIM Bank Research

prices eased. The global composite carbon steel prices, which stood at US$ 686/tonne in June 2013, touched a peak at US$ 726/tonne in January 2014; owing to a demand-supply mismatch, the prices plunged to US$ 592/tonne in February 2015. This was the tenth consecutive decline in global steel prices since May 2014 (Exhibit 6).

2.7 Iron Ore Price

Iron ore is an important raw material for steel production. International spot prices of coking coal and iron ore corrected significantly. In 2013, international spot prices of coking coal increased by 5.2 per cent y-o-y to an average of US$ 135 per tonne in 2013 from an average of US$ 128 per tonne in 2012.

Price in May 2015 stood at US$ 60.2 per dry metric tonne, as compared to US$ 100.5 per dry metric tonne a year ago. Prices have dipped significantly since May 2010 when it hovered around US$ 161.35 per dry metric tonne.

In recent months, deteriorating Chinese steel demand and deleveraging by traders and Chinese steel mills has dragged the metal prices. The withdrawal of a stimulus package and the Chinese Government's efforts to make the economy consumption-driven from an investment-driven one will further ease steel demand and consequently the metal's production.

In the past, there were two major iron ore producers in Australia, Rio Tinto and BHP Billiton. They have now been joined by a third producer,

Exhibit 6: Global Composite Carbon Steel Prices (US$ / tonne)

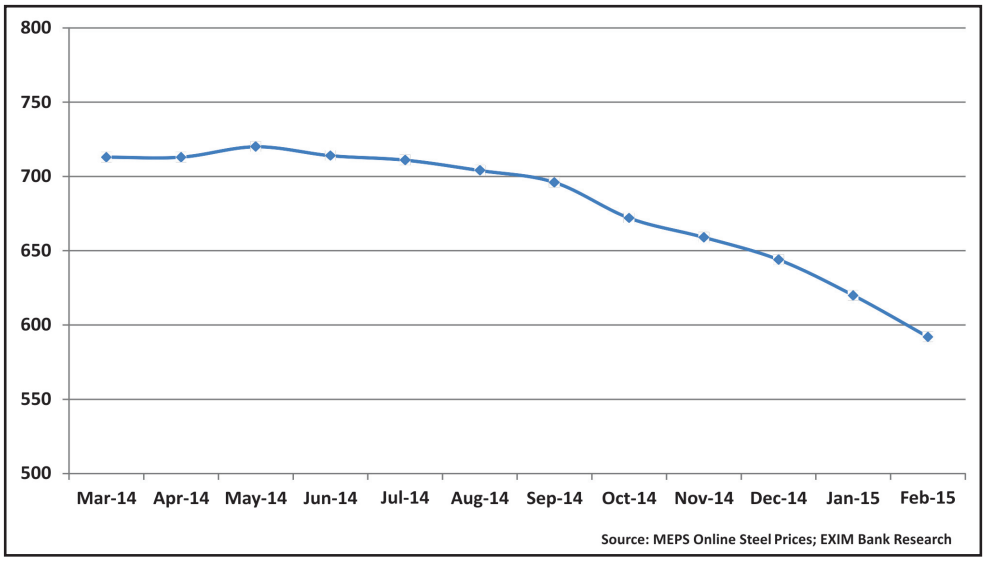
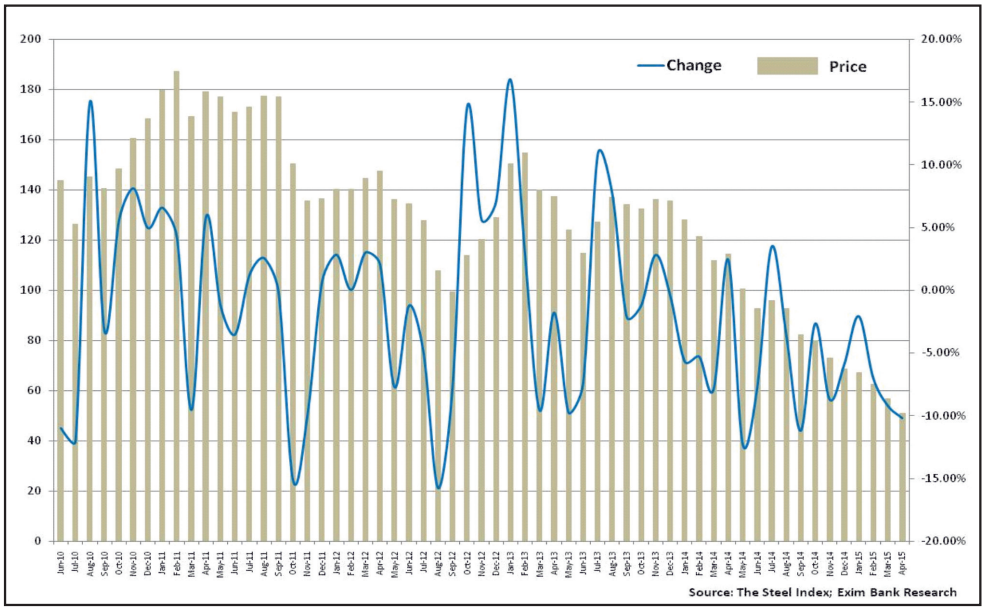


Exhibit 7: Global Iron Ore Prices (US$ per Dry Metric Tonne) and Change in Price



Fortescue Metals. These three producers are anticipated to provide for bulk of the increase in iron ore supply over the next few years. Brazil, another significant contributor to iron ore in the world, is suffering from a combination of project delays and infrastructure bottlenecks and has thereby experienced restrictions on iron ore supplies in 2013. However, outside Australia and Brazil, growth in supply is expected to be limited. It may be noted that, Australia holds the position as one of the lowest cost iron ore producers globally.

As mentioned, global iron ore prices have touched US$ 51.1 a tonne as on April 2015 its lowest level since 2009 (Exhibit 7). In India, mining curbs due to court action against illegal mining have constricted iron ore supply. That along with falling global prices, has stoked rising imports in the country as a deepening shortage at home forces steelmakers to turn overseas for the raw material. Gathering momentum in Indian imports may absorb some of the global surplus of iron ore and help stabilise prices that have been hammered by slowing demand from the top buyer China.

SELECT TRENDS IN WORLD STEEL MANUFACTURING

2.8 Product Development

There are thousands of different types of steel, designed to meet the specific needs of end users. Many of the products were developed in the last

ten years. Safety requirements, cost restrictions, structural performance demands innovations in steel production. In addition, increasing environmental pressures are leading to innovation in steel manufacturing technology, as also design and applications in end user industries. For example, advanced high-strength steels are helping carmakers meet the performance demands with affordable solutions. With the rising climate change concerns, the next generation automobiles would include alternative powertrains, such as hybrids and fuel cells. Steel producers have developed Ultra Light Steel Auto Body (ULSAB), which has achieved 25 per cent reduction in vehicle mass, re-establishing the position of steel as a viable light-weight material for the automotive market. Similarly, the World Steel Association has initiated a new project called 'Living Steel' to stimulate innovation in design, supply and use of steel in construction.

2.9 Technology Development

Modern steelmaking relies on advanced technologies. International competition is so fierce in the steel sector that even a small technological difference would generate a competitive advantage. Steel companies all over the world are investing in state-of-the-art steelmaking systems and practices to improve their operations and yield. Thus, steel majors are joining hands with the national Governments to undertake R&D projects addressing a broad range of challenges. One of the important challenges of the steel manufacturing is yield loss. R&D projects are being undertaken by steel majors in identifying yield saving opportunities in steel manufacturing; improvements in operating techniques and practices with the objective of reducing the yield losses; improvement of fuel efficiency and productivity by capturing the heat-value of by-product gases and optimising its mix of feedstocks, and using proper process equipments that reduces the yield losses.

2.10 Accident-Free Steel

Many steel companies in the world are improving their health and safety performance in the plants, and some of them have achieved production without any lost-time injuries for many years. In such companies too, there is a new thinking which clearly states that accidents are avoidable and 'accident free' steel is the practical goal of the future. These companies are developing and establishing a safety culture within the organisation and managing safety from a behavioural perspective as a powerful approach to the management of safety. The firms have also developed a safety policy for contractors, as there is widespread use of contractors in steel plants.

2.11 Sustainable Steel

According to Inter-Government Panel on Climate Change (IPCC), the steel industry accounts between 3-4 per cent of total world greenhouse gas emissions. On an average, 1.7 tonnes of carbon di-oxide are emitted from every tonne of steel produced. It was also estimated that over 90 per cent of steel industry emissions come from iron production in the countries of Brazil, China, India, Japan, Korea, Russia, Ukraine and USA, including EU-27 region. Over the years, the steel industry has achieved technological advancements that have enabled substantial reduction of emissions from steel production. These achievements include, enhanced energy efficiency in the steel making process, improved recycling of steel products, improved use of by-products from steel making, and better environmental protection techniques.

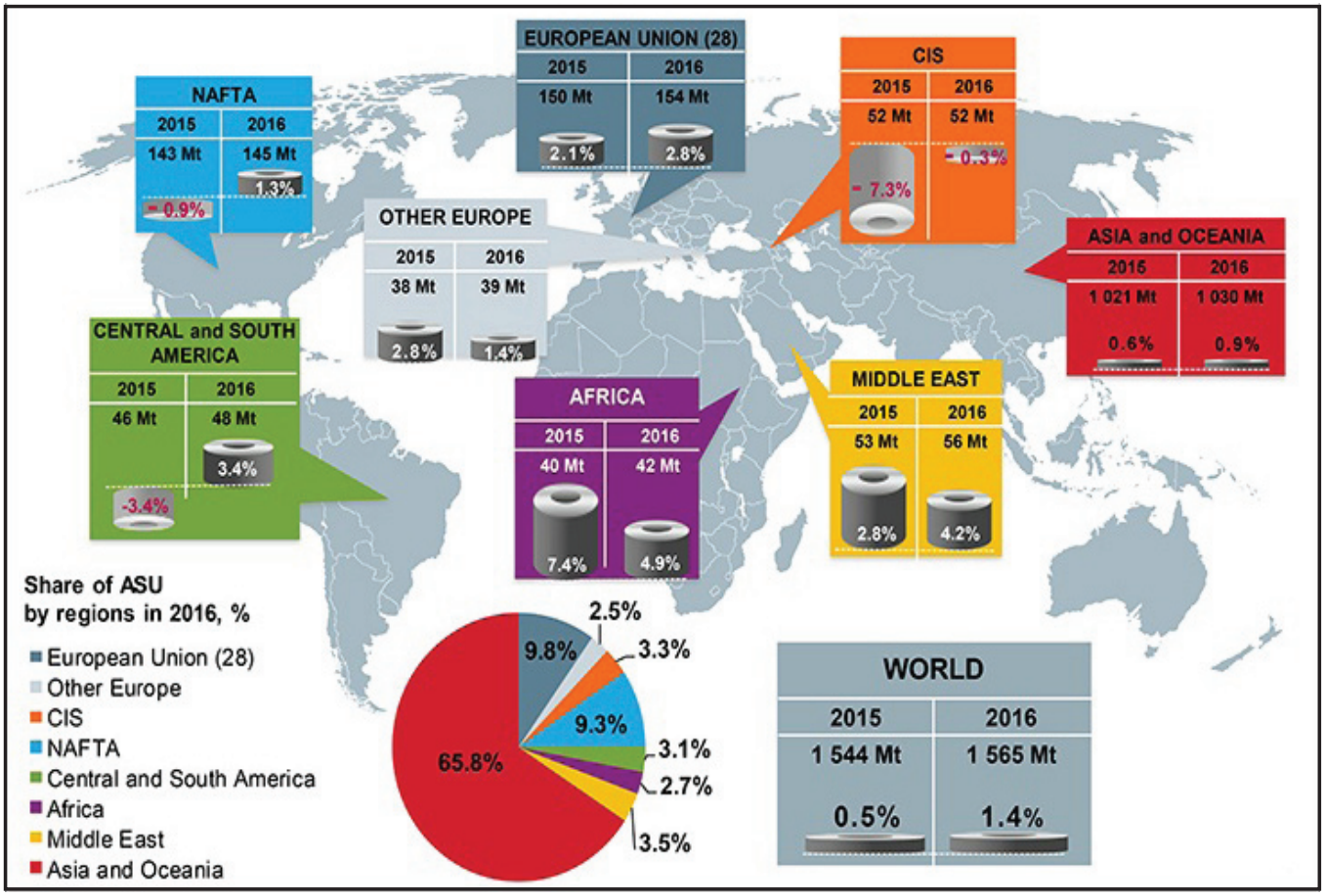
World steel majors are continually investing to find solutions for cleaner production. These may include, changes in process or manufacturing technology, change of input materials (for example, using raw materials that are low in sulphur), reuse and recycling of materials onsite, improved housekeeping, and training. Steel Task Force of the Asia-Pacific Partnership on Clean Development and Climate has developed a State-of-the-Art Clean Technologies Handbook, which details out some of the best available technologies and solutions that can be implemented at steelmaking facilities to increase energy efficiency and improve environmental performance.

Number of different national approaches to emissions reductions is being adopted. Japanese steel industry is engaged in voluntary action progranmme comprising a range of efforts from international technical cooperation to research and development into further by-product uses. The steel industry in USA has signed a voluntary climate vision programme with a commitment of improving energy intensity by 10 per cent using the year 2002 as base line. The steel industries in USA, Japan, Korea, Australia and Canada are also involved in the Asia-Pacific Partnership on Clean Development and Climate, which also involves China and India. World Steel Association is adopting the approach of collection of carbon emission data from major steel producing countries and benchmarking to make improvements in commitments at national or regional level.

2.12 Life Cycle Assessment

Life Cycle Assessment (LCA) is one of the tools increasingly being used while considering environmental issues associated with the production, use, and disposal and recycling of products, including the original source-materials

Exhibit 8: Outlook by Apparent Steel Use (MT) – 2015 and 2016



Source: World Steel Association

with which steel is made. LCA of a steel product looks at resources, energy and emissions, from the raw material extraction phase to its end-of- life phase, including recycling and disposal. LCA can be used to identify priorities for improvements in process operations and product design and development. Global steel makers are increasingly developing and supporting the use of a consistent, rigorous and transparent LCA methodology to enable society and regulators to make informed choices based on the real environmental impact of products and processes. Steel is 100 per cent recyclable, which means it can be reprocessed into the same material of the same quality again and again. Recycling accounts for significant energy and raw materials savings: more than 1,400 kg of iron ore, 740 kg of coal, and 120 kg of limestone are saved for every tonne of steel scrap made into new steel.

OUTLOOK

Despite its size, the steel industry remains relatively fragmented. It is also highly cyclical and has on intensely competitive nature. After witnessing sturdy growth for most of the initial phase in the last decade, the global steel industry suffered a setback due to the recession in 2008 as consumers utilized existing inventories rather than buying new stocks. The industry witnessed a turnaround in late 2009 and continued to grow thereafter in sync with the global economic recovery. Demand for steel benefited from growth in the developing economies that helped counter the sluggishness in developed countries. Asia, particularly China, continued to be the principal growth driver. Demand for steel products, nonetheless, remained below pre-recession levels. In 2013, the continuing Eurozone sovereign debt crisis, economic stagnation or slow growth in developed economies and a cooling of emerging market economies had an adverse impact on the industry which spilled to 2014.

Expanding steel production in China, the world's largest producer and consumer of steel, even as domestic consumption tapers, has been the single biggest drag on global prices. Add to this, the growth in the Chinese economy, which in recent years has been one of the main demand drivers for steel, slowed. These challenging economic conditions continued into 2014, hindering the industry growth.

While the global steel demand-supply gap has narrowed since the slump created in the post-2008 period, production still exceeds demand. Worldsteel forecasts that in 2015, the world steel demand will reach 1,544 MT. It further forecasts that world steel demand will grow by 1.4% and reach 1565 MT in 2016.

3. INDIAN SCENARIO

Evolution of Indian Steel Industry

The Indian iron and steel industry is almost a century old. Iron Work Company established the first iron and steel company at Kulti (West Bengal) in 1870. However, large-scale production started only after setting up of Tata Iron and Steel Company (TISCO), in 1907. At the time of independence in 1947, India had a small capacity of iron and steel production of about 1 million tonne per annum. During that time, the entire capacity of the iron and steel industry was in the private sector. Infact the second oldest steel plant in India, the Indian Iron & Steel Company Limited (IISCO), established in 1918 in Burnpur, West Bengal, was then listed with the London Stock Exchange. Later it changed hands and is currently owned by public sector steel behemoth, the Steel Authority of India (SAIL).

The thrust to the capital-intensive industries, especially setting up of steel plants was given in the second and third five-year plan periods. Three integrated steel plants were set up in the public sector at Bhilai (Madhya Pradesh), Durgapur (West Bengal) and Rourkela (Orissa), with a capacity of one million tonnes each. Subsequently, two more public sector integrated steel plants were set up at Bokaro (Jharkhand) and Vishakapatnam (Andhra Pradesh).

Since the time public investment in steel sector started, market protection had also started for the indigenous industry by way of reservation (large scale integrated capacity of above 1 million for public sector), dual pricing system with distribution controls for both public and private sector, protection from import competition through tariff barriers as well as quantitative restrictions and import licensing.

Apart from policy related protection, the industry was given protection in terms of market and prices through administered pricing mechanism. There was freight equalization mechanism to make the prices uniform irrespective of the distance of deliveries. The basic selling price of steel was administered

and fixed based on the normative cost of production plus return on capital. There were also cess and levies like Joint Plant Committee (JPC) cess, Steel Development Fund (SDF) levy, import pool fund etc. Import was canalized and a fund was created for mopping up the balance between the lower international procurement prices with higher domestic sales prices.

In the seventies, the industry witnessed emergence of few small-scale secondary steel producers, (electric arc furnace and induction furnace units) in the private sector to bridge the gap between rising domestic demand and stagnating supply from the existing integrated plants. Encouragement to private sector was given due to slow down in the public investment as a result of resource crunch and less plan allocation for capital investment. The semi-finished ingots/billets produced by this sector led to the commissioning of a large number of re-rolling units to convert semi finished steel bars and rods used mainly in the construction industry.

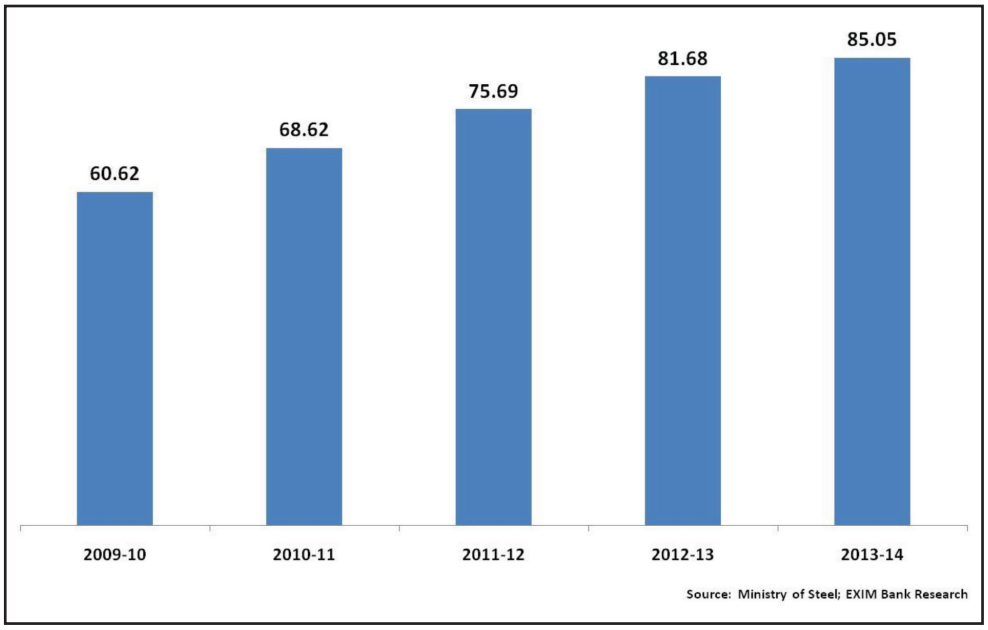
The Indian steel sector was the first core sector to be completely freed from the licensing regime and the pricing and distribution controls. Since 1991, the sector witnessed reforms increasingly in every aspect. The sector was open to private investment with large-scale deregulation (decontrol of price, distribution and capacity, withdrawal of import and export restrictions, etc.). In this decade, the steel sector added around 12 million metric tonnes capacity, from 21 new projects.

3.1 Production

Crude steel production in India amounted to 81.54 MT in 2013-14, registering a growth of 4.0 percent as compared to the previous year. The production for sale of total finished steel (alloy + non-alloy) in the country stood at 85.05 MT in 2013-14 as compared to 14.23 MT in 1991-92 – an increase of nearly 6 times. The high share of the Majors (like Essar, JSW Ispat, JSWL) and Other Producers (Electric Arc Furnace, Induction Furnace, Corex - Basic Oxygen Furnace, etc.) in total finished steel production for sale is largely due to substantial availability of raw materials like sponge iron, as well as due to the expansion of capacities and emergence of new units in these segments.

The total production for sale of pig iron was 7.29 MT in 2013-14 as compared to 1.59 MT in 1991-92. Earlier, pig iron was produced primarily by the integrated public sector steel plants, SAIL and RINL. However, today, the private sector accounts for over 90% of total production for sale of pig iron in the country.

Exhibit 9: Production for Sale of Finished Steel (Million Tonnes)



In the case of DRI (direct reduced iron), India is one of the largest producers in the world. From a mere 1.31 million tonnes of production in 1991-92, India's DRI production reached 14.972 million tonnes in 2013-14 after touching a high of 25.081 million tonnes in 2010-11.

The categorywise production of pig iron and finished steel in India during the period 2013-14 shows that rods/ bars and HR Coils/Strips were the largest produced categories with shares of 35 per cent and 23 per cent, respectively. As far as growth amongst these categories are concerned, segments like structurals, CR Sheets/ Coils, Galvanised Plain / Galvanised Coil (GP/GC) Sheets were the ones exhibiting highest growth rates of 11.8 per cent, 11.8 per cent, and 11.3 per cent, respectively. However, HR sheets showed a significant decline on year on year basis by 27.4 per cent (Table 6).

As per the latest data available for 2014 from World Steel Association, India produced 83.2 million tonne of crude steel, up 2.5 per cent over 81.2 MT in the year-ago period. In comparison, global production stood at 1662 MT, witnessing an increase of just 0.8 per cent over previous year.

Table 6: Category-wise Production of Pig Iron and Finished Steel in India ('000 tonnes)

Category	Total Production for Sale	
	2013-14	2012-13
Pig Iron	**7287**	**6870**
Sponge Iron	**14972**	**14325**
Semis	**30288**	**31380**
Rods/Bars	30019	28794
HR Coils/Strips	19466	19390
Structurals	6632	5932
CR Sheets/Coils	8554	7654
GP/GC Sheets	6996	6287
Plates	3992	4162
Pipe (large dia)	2021	2006
Railway materials	883	938
HR Sheets	403	555
Tin plate	300	301
Electrical steel sheets	156	155
TMBP Coils	5	5
Total (Finished steel Non – Alloy)	**79444**	**76195**
Finished steel (Alloy)		
Non-Flat	3659	3698
Flat	1951	1788
TOTAL (Finished Steel Alloy)	**5610**	**5486**
TOTAL (Finished Steel)	**85054**	**81681**

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

HR : Hot Rolled
CR : Cold Rolled
GP : Galvanised Plain
GC : Galvanised Coil
TMBP : Tin Mill Black Plate

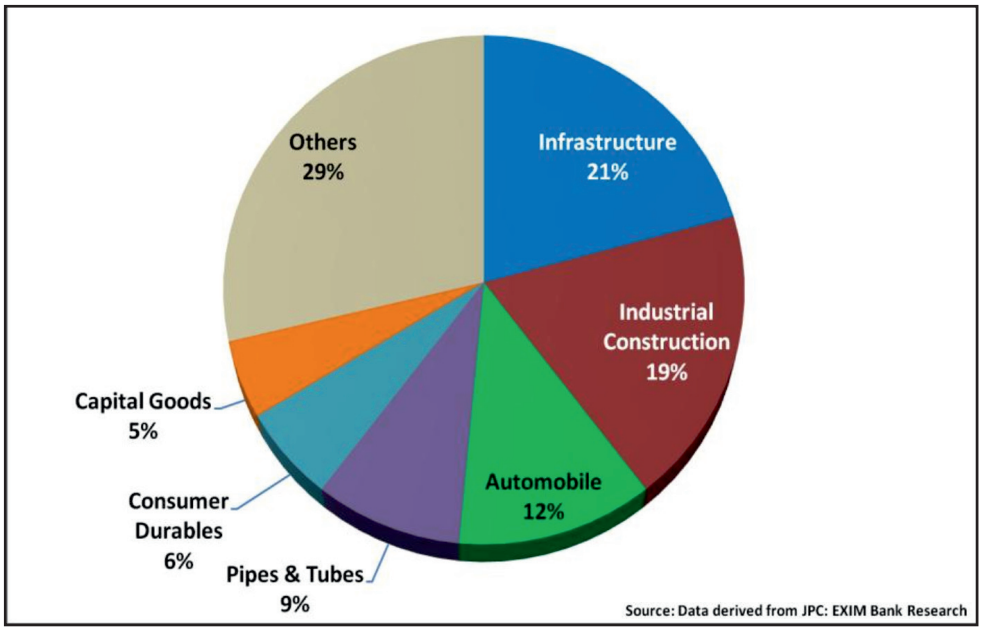
Among major steel producing countries, only South Korea and Russia were ahead of India in terms of growth rates at 7.6 per cent and 2.8 per cent, respectively. The US exhibited recovery and grew at 1.7 per cent (88.3 MT productions during 2014 compared to 2013). Japan showed a growth of 0.2 per cent (110.7 MT production during 2014) and Germany grew at 0.7 per cent (42.9 MT production during 2014).

3.2 Consumption Pattern

Among end-user sectors, infrastructure and industrial construction together continued to account for about 40 per cent of total steel consumption in 2013-14, followed by automobiles (12 per cent) and the pipes & tubes industry (9 per cent) (Exhibit 10).

In tune with the economic gloom, India's finished steel consumption grew by a tepid 0.6 per cent in 2013-14 over 2012-13. Domestic real consumption of total finished steel stood at 73.89 million tonnes (MT) during 2013-14. This was largely because of the low quarterly growth rates of GDP during the year 2013-14 with full year figure at 4.7 per cent, along with a steady decline in growth rate of IIP in 2013-14 with annual growth declining by 0.1 per cent over 2012-13, and steep decline noted in sectors like capital goods, manufacturing, consumer durables, motor vehicles, trailers & semi-trailers, and slow and low growth in sectors

Exhibit 10 : Steel Consumption Pattern in India : 2013-14



like basic goods and intermediate goods. The slow down in the rate of investment as indicated by the growth rate of gross fixed capital formation in GDP (at 32.3 per cent of GDP in 2013-14, down from the 33.9 per cent of GDP of 2012-13) also impacted the consumption pattern of steel.

The trend of last 6 years in domestic steel consumption indicates that though the marginal growth rate of 0.43 per cent in 2008-09 may be attributed to the impact of the recession of 2008, markets have however recovered since then, pushing up steel consumption growth to as high as 13.3 per cent in 2009-10 (a growth rate which to some extent can be attributed to base effect).

Nonetheless, the volume of steel consumed in the economy has grown steadily in absolute terms, yet the year on year growth rates have dropped consistently. The drop in later days are attributable to the onset of the slowdown in the Indian economy itself, with steel consumption finally hitting 0.6 per cent growth in 2013-14, marginally up from the decadal low reached in 2008-09.

An analysis of the 5 year period before the global financial crisis and after the crisis shows interesting results. The trend in growth rate in domestic steel consumption in the five year periods, preceding (2003-04 and 2007-08) and post recession of 2008 (2009-10 to 2013-14) indicates clearly the dampening effect of the twin effects of recession of 2008 and slowdown in domestic economy in the post-recession period (7.2 per cent average annual growth) compared to the pre-

Table 7: Total Finished Steel Consumption

Year	Quantity (MT)	Percentage Change (y-o-y)
2008-09	52.35	0.43
2009-10	59.34	13.3
2010-11	66.42	11.9
2011-12	71.02	6.9
2012-13	73.48	3.5
2013-14	73.89	0.6

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

Table 8: Consumption Pattern of Steel in India: Pre and Post-Recession

Year		AAGR of Consumption of Steel in India
2003-04 and 2007-08	5 years preceding recession of 2008	11.2
2008-09	Crisis period	0.4
2009-10 and 2013-14	5 years post-recession of 2008	7.2

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

recession five yearly average growth of 11.2 per cent (Table 8).

3.3 Category-wise Real Consumption

Category-wise real consumption of total finished steel was led by non-flat steel (41.28 MT) which recorded a growth rate of 2.6 per cent on year on year basis, while growth rate declined for flat steel consumption (32.61 MT) by 2.0 per cent during 2013-14. This was also reflected in the respective shares, with the share of flat steel in total consumption (44 per cent) dropping marginally in 2013-14 accompanied by a gain in the share of long/non flat steel (56 per cent) during the year as compared to the last year (Table 10).

For non-alloy steel, contribution of the non-flat segment stood at 37.61 MT, up y-o-y by 3.4 per cent and that of the flat segment (after accounting for double counting) stood at 31.70 MT, up y-o-y by 1.5 per cent, taking total non-alloy consumption (after double counting) to 69.311 MT. The remainder was the contribution of alloy segment, which reported a negative growth of 21.8 per cent during this period and dragged down overall consumption growth trends in 2013-14.

Table 9: Real Consumption of Total Finished Steel (Alloy + Non-alloy)

Year	2012-13	2013-14	Percentage Change (y-o-y)
Total Finished Steel, of which	73.48	73.89	0.6
Non-flat steel	40.22	41.28	2.6
Flat steel	33.26	32.61	(-) 2.0

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

In the non-alloy, non-flat segment, the major contributor to consumption was bars and rods (30 MT; y-o-y growth of 2.3 per cent). For the major categories in the flat segment, the picture was mixed with declines noted for plates (4.32 MT, down by 11.7 per cent), HR coils / strips (19 MT, down by 3.5 per cent), while consumption rose for CR Sheets / Coils (9.4 MT, up by 7.8 per

Table 10:Category-wise Real Consumption Trends ('000 tonnes)

Category	2012-13	2013-14	Percentage Change (y-o-y)
Rods/Bars	29445	30127	2.3
Structurals	5987	6616	10.5
Railway materials	946	870	-8.0
Non-Flat (A)	**36378**	**37613**	**3.4**
HR Coils/Strips	19817	19124	-3.5
CR Sheets/Coils	8807	9425	7.0
GP/GC Sheets	5230	5637	7.8
Plates	4891	4317	-11.7
Pipe (large dia)	2046	2007	-1.9
HR Sheets	485	444	-8.5
Tin plate	435	418	-3.7
Electrical steel sheets	541	499	-7.8
TMBP Coils	5	6	20.0
Flat (B)	42338	41950	-0.9
Less: Double Counting (C)*	11094	10252	-7.6
Flat steel after double discounting (D)	**31244**	**31698**	**1.5**
Total: Non-Alloy (A+D): (E)	**67622**	**69311**	**2.5**
Total: Alloy (F)	**5860**	**4584**	**-21.8**
Total Finished Steel (E+F)	**73482**	**73895**	**0.6**

* A significant quantity of steel is counted twice. For example, steel maybe bought for value addition such as galvanisation, and then resold in the market as premium steel.
Source: Data Derived from Joint Plant Committee

HRC : Hot-Rolled Coil
CRC : Cold Rolled Coil
GP/GC : Galvanised Plain/Galvanised Coil
TMBP : Tin Mill Black Plate

cent) and GP/GC (5.6 MT, up by 7.8 per cent) during 2013-14 as compared to 2012-13.

3.4 Per Capita Steel Consumption

On account of the steady growth in the domestic steel consumption, India became the third largest consumer of steel globally in 2009, and continued to remain so till 2014. China was the largest consumer with a consumption of 711 MT in 2014.

In tune with the absolute levels reached and the prevailing economic and steel conditions, India's per capita steel consumption (in terms of total finished steel) has grown from 45 kg in 2008-09 to 59.3 kg in 2012-13 before falling to 59 kg in 2013-14.

Though this rise is commendable, yet the fact remains that compared to global average (222 kg) or even India's global peers (China 489 kg), per capita consumption of steel is significantly low in India. One of the main reasons of such an outcome being the extensive use of steel in large scale infrastructure activities and other end-use segments like manufacturing in developed countries or even in countries like China, South Korea vis-à-vis India.

Table 11: Investments in Steel Sector

Year	New investment projects announced		Investment projects completed	
	Rs. million	Numbers	Rs. million	Numbers
2004-05	1,122,248.10	57	11,445.00	12
2005-06	2,259,422.10	78	160,570.10	28
2006-07	1,800,798.40	84	56,573.80	30
2007-08	1,447,529.40	79	237,583.80	49
2008-09	1,349,091.30	32	109,812.20	27
2009-10	2,859,548.30	39	151,352.90	20
2010-11	1,368,959.30	25	292,916.80	29
2011-12	413,042.20	21	422,631.20	27
2012-13	437,578.00	12	53,372.20	11
2013-14	752,424.00	15	65,796.90	12
Numbers refers to the number of projects for which cost details are available				

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

3.5 Investments in Steel Sector

Investments announced in steel sector while having seen a decrease from Rs. 1,122,248 million in 2004-05 to Rs. 752,424 million in 2013-14, the number of projects completed however in terms of value have witnessed an increase from Rs. 11,445 million to Rs. 65,797 million during the same time period (Table 11).

Table 12: Export of Iron and Steel (In '000 tonnes)

Year	Pig Iron	Semi-Finished	Finished Carbon Steel	Total Steel
1991-92	-	5	368	373
1992-93	16	154	741	911
1993-94	620	585	1020	2225
1994-95	466	399	873	1738
1995-96	502	395	925	1822
1996-97	451	300	1622	2373
1997-98	785	503	1880	3168
1998-99	281	174	1770	2225
1999-00	290	328	2670	3288
2000-01	230	195	2805	3230
2001-02	242	270	2730	3242
2002-03	629	460	4506	5595
2003-04	576	701	5221	6498
2004-05	393	261	4381	5035
2005-06	300	350	4350	5000
2006-07	707	665	4893	6265
2007-08	560	400	4600	5560
2008-09	350	746	4437	5533
2009-10	362	625	3251	4238
2010-11	358	350	3637	4345
2011-12	491	201	4587	5279
2012-13	414	144	5368	5926
2013-14	943	486	5594	7023

Source: Data Derived from Joint Plant Committee; EXIM Bank Research

3.6 Exports and Imports of Iron and Steel

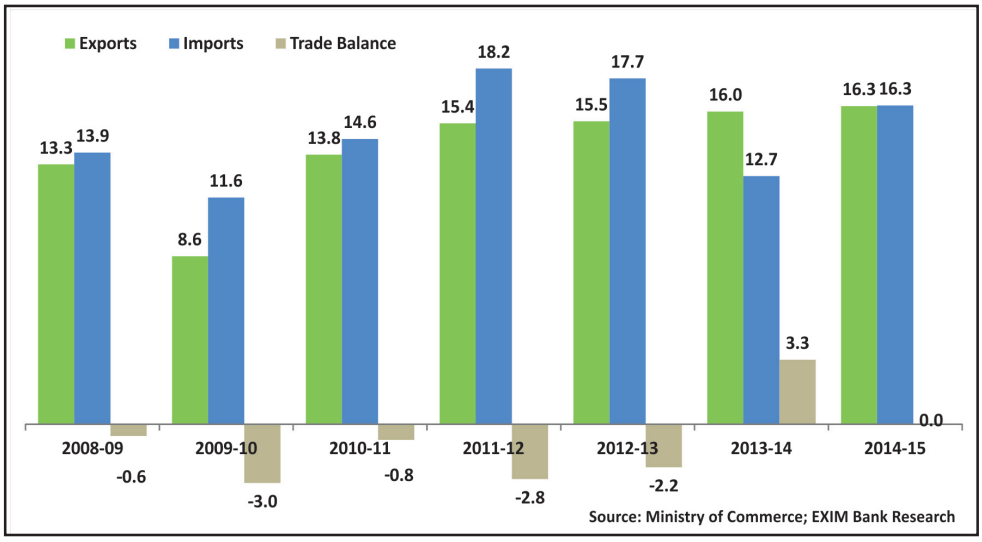
Although India started exporting steel way back in 1964, exports were not regulated and depended largely on domestic surpluses. However, post-liberalization, export of iron and steel recorded a quantum jump in India. Subsequently, the rapid growth of domestic steel demand has led to a decline in the rate of growth of steel exports from India to ensure that domestic requirements are adequately met.

During 2013-14, India's exports were around 7 million tonnes, of which finished carbon steel constituted 92%, whereas pig iron and semi-finished iron together constituted 8% (Table 12).

In India, imports of carbon steel touched 5.4 million tonnes in 2013-14, whereas the import of pig iron was very low constituting 34,000 tonnes. However it may be noted that import of steel reached a high of 7.9 million tonnes the previous year (2012-13). In the year 2007-08, India became a net importer of iron and steel for the first time in the post liberalization period.

In terms of value, India's exports of iron and steel in the year 2008-09 was US$ 13.3 billion, and India's imports of iron and steel were valued at US$ 13.9 billion, leading to a trade deficit of US$ 0.6 billion under this category. Export and imports figures herein are calculated considering summation of HS Code 72 (iron and steel) and HS Code 73 (articles of iron or steel). After having witnessed

Exhibit 11: India's International Trade in Iron and Steel (US$ Bn)



a trade deficit for a number of years, in 2013-14 India displayed a trade surplus of US$ 3.3 billion in iron and steel. However, in 2014-15, India exhibited a marginal trade deficit of US$ 35 mn in iron and steel (Table 13).

India's export markets for steel are well diversified and less concentrated as compared to imports. While India's exports of iron & steel (HS Code 72) during 2003-04 was hugely concentrated to China, the share declined drastically in 2014-15. Unlike 2003-04, India's exports of iron and steel (HS code 72) seemed quite diversified across regions and countries in 2014-15 (Table 14).

However, India's exports of articles of iron and steel (HS code 73) remained concentrated within USA and UAE, both during 2003-04 and 2014-15, with their cumulative shares being 34.7 per cent in 2003-04 and 31.7 per cent in 2014-15 (Table 14).

3.7 Profitability

While steelmakers can be classified based on multiple factors such as scale of operations, product profile and the level of raw material integration, it

Table 13: Trade Balance in India's Steel Trade (Value in US$ Mn)

HS Code: 72 (Iron & Steel): A							
	2008-09	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Exports	7533	4516	7139	8302	8090	9223	8684
Imports	10265	8814	11010	13646	13616	9110	12342
Trade Balance	-2732	-4298	-3871	-5344	-5526	113	-3658
HS Code: 72 (Iron & Steel): B							
Exports	5783	4081	6657	7048	7436	6807	7601
Imports	3667	2793	3617	4529	4101	3596	3978
Trade Balance	2116	1288	3040	2519	3335	3211	3622
Total: A+B							
Exports	13316	8597	13796	15350	15526	16030	16284.75
Imports	13932	11607	14627	18175	17717	12706	16320.24
Trade Balance	-616	-3010	-831	-2825	-2191	3324	-35.49

Source: Data Derived from Ministry of Commerce; EXIM Bank Research

Table 14: Top 10 Destination of India's Exports: 2003-04 and 2014-15

HS Code 72: Iron & Steel (per cent share)				HS Code 73: Articles of Iron & Steel (per cent share)			
2003-04		2014-15		2003-04		2014-15	
China	23.0	USA	8.1	USA	21.6	U S A	22.5
USA	7.5	Iran	7.5	UAE	13.1	UAE	9.2
UAE	4.9	UAE	7.4	UK	6.7	Saudi Arabia	8.0
Thailand	4.7	Italy	6.4	Bangladesh	5.4	Germany	6.1
Italy	4.3	Nepal	6.0	Germany	4.1	UK	4.9
Iran	4.1	South Korea	3.7	Singapore	2.5	Italy	2.7
South Korea	3.7	Belgium	3.2	Nigeria	2.5	Canada	2.3
Sri Lanka	3.6	Thailand	3.0	Australia	2.2	The Netherlands	1.7
Nepal	3.1	Japan	2.8	Saudi Arabia	2.1	France	1.7
Indonesia	3.0	Bangladesh	2.8	Canada	2	Iran	1.6

Source: Data Derived from Ministry of Commerce; EXIM Bank Research

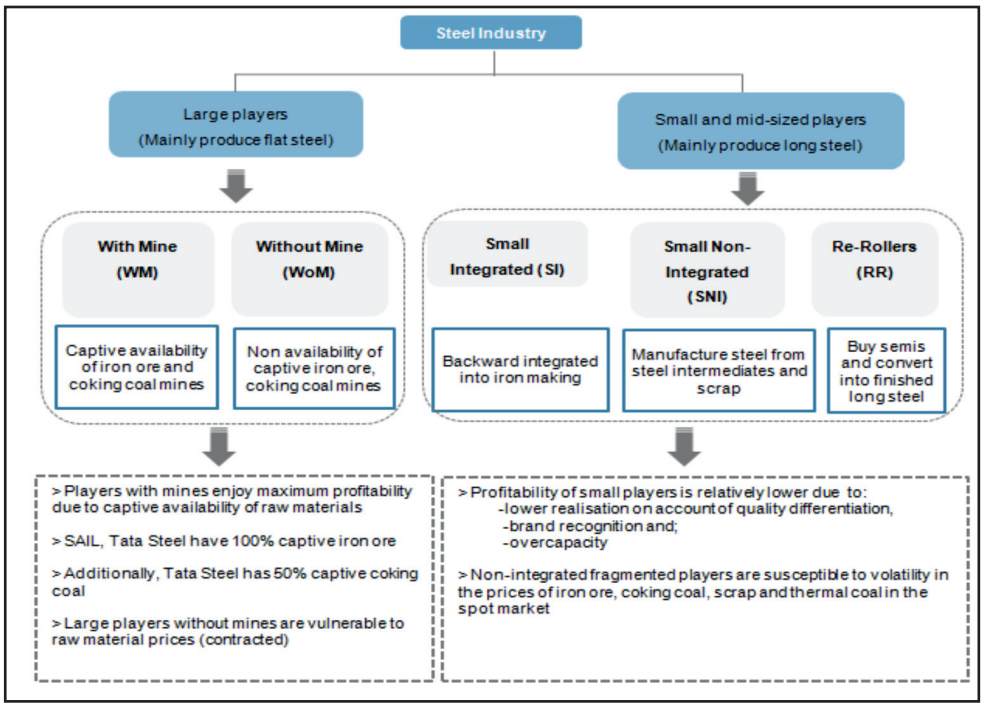
is the lend of raw material integration that is critical to the margins they earn. Large steelmakers have and will continue to have a dominant share in steel production. These players mainly produce flat steel, which is capital intensive. Even among large players, the level of integration varies, depending on accessibility to iron ore mines. Several players have captive access to iron ore.

Raw material integration is significant because raw materials - iron ore and coking coal - constitute 60-70 per cent of production costs for finished steel. Hence, players with captive mines possess better operating leverage and pricing flexibility, as compared to integrated players without captive mines, and non-integrated players. Small & mid-sized players, on the other hand, mainly produce long steel, which requires lower capital investments. Most of these players are non-integrated and buy key inputs from the open market.

3.8 Current Outlook

Domestic steel demand growth is expected to remain subdued in 2014-15 and 2015-16 largely owing to execution delays in construction projects and lower demand for automobiles and consumer durables. Over the longer term steel demand is expected to grow at a brisk pace, as growth in key end-user sectors revives.

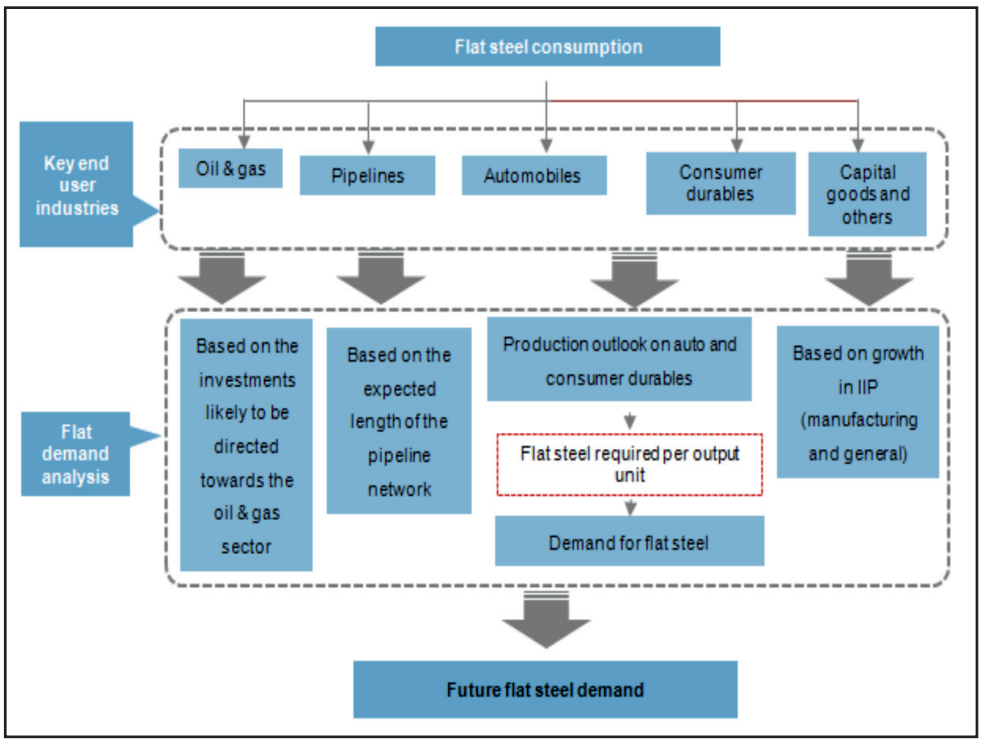
Exhibit 12: Structure of the Steel Industry



A slowing economy continued to curtail domestic steel demand in 2013-14. Finished steel consumption is estimated to have grown by a muted 0.6 per cent y-o-y; the lowest in 5 years, to 73.89 million tonnes during 2013-14. Over 2009-10 to 2013-14, demand registered a CAGR of 7.2 per cent, spurred by rising investments in the infrastructure and construction sectors, and a strong growth in sales of capital goods and automobiles. India however remained one of the world's largest producer and consumer of crude steel in 2014, despite the sluggish demand.

Among end-user sectors, infrastructure and industrial construction together continued to account for about 40 per cent of total steel consumption in 2013-14, followed by automobiles (12 per cent) and the pipes & tubes industry (9 per cent). Domestic demand for steel, especially in the construction and infrastructure sectors, has been affected by delays in project execution, owing to environmental clearances. Slowing economic growth has also put the brakes on consumption driven sectors such as the automobiles and consumer durables. Aggregate

Exhibit 13: Flat Steel Consumption: Key End-User Industries



investments are expected to grow at a sluggish pace, impacted by a slowdown in industrial capex and infrastructure investments. Implementation of projects in key infrastructure segments like power, irrigation and roads is expected to suffer during the year on account of land acquisition issues, delays in clearances and the strained finances of companies. Investments in the construction space are also likely to grow at a muted pace in 2013-14 and 2014-15. However, it is expected that industrial and infrastructure investments will improve gradually during the next five years. It is therefore believed that growth will be driven by key end-user sectors such as construction, infrastructure and automobiles.

4. PRODUCT AND MARKET IDENTIFICATION OF STEEL PRODUCTS OVERSEAS

4.1 COMPETITIVENESS OF INDIA'S EXPORTS

The year 2013-14 was a turnaround year with exports exceeding imports after a long hiatus. For this trend to continue, it might be essential for domestic producers to expand their supply base into overseas markets. Currently, India's steel production is largely geared towards the domestic market, with only a small share being exported. The country has significant comparative advantage in several steel products, but has not been able to leverage it to the fullest in overseas markets.

The present section provides an analysis of iron and steel products and markets where the country has demonstrated comparative advantage. Quantification of comparative advantage over a period of time will help in understanding the markets and products where India has been performing well, as well as identifying the areas where producers have lost ground and success has been limited. This will be a necessary first step towards identification of areas where Indian companies could potentially expand their presence.

4.2 Methodology:

Revealed Comparative Indices are used to identify categories of exports in which an economy has a comparative advantage by way of comparison of the country's trade scenario with the world scenario. The basic assumption underlying the concept of revealed comparative advantage is that trade profile reflects the inter-country differences in terms of relative costs as well as non-price aspects. As per Balassa's (1965) measure, index for country i for commodity j is-

$$RCA_{ij} = \frac{(X_{ij}/X_i)}{(X_{wj}/X_w)}$$

Where,

X_{ij}: exports from country i of commodity j

X_i: total exports from country i

X_{wj}: total world exports of commodity j

X_w: total exports from world

The RCA index ranges from 0 to infinity, with 1 as the break-even point. That is, an RCA value of less than 1 means that the product does not have a comparative advantage, while a value above 1 indicates that the product has a comparative advantage.

In order to enable disaggregation of the analysis of revealed comparative advantage at the regional and bilateral levels, the above equation is adapted as follows[3]:

$$RCA_{ijr} = \frac{(X_{ij}/X_i)}{(X_{rj}/X_r)}$$

Where,

X_{ij}: exports from country i of commodity j

X_i: total exports from country i

X_{rj}: exports from region r of commodity j

X_r: total exports from region r

The normalized revealed comparative advantage (NRCA) index has been demonstrated to reveal the extent of comparative advantage that a country has in a commodity more precisely and consistently than other alternative RCA indices in the literature. NRCA can be defined in the following manner:

$$NRCA_{ij} = \frac{RCA_{ij}(\text{or } RCA_{ijr}) - 1}{RCA_{ij}(\text{or } RCA_{ijr}) + 1}$$

NRCA ranges from -1 to 1 with 0 as the break-even point. That is, an NRCA value of less than 0 and greater than -1, means that the product has no export comparative advantage, while a value above 0 and less than 1, indicates that the product has a comparative advantage. NRCA for India's exports is given in Annexure 2 for products at HS-6 digit level.

For the purpose of analysis, iron and steel exports have been divided into six categories (at HS-4 digit level) as

[3]Giancarlo Gandolfo (2014), International Trade Theory and Policy. Springer Berlin Heidelberg

Table 15: Categorization of Iron and Steel HS codes

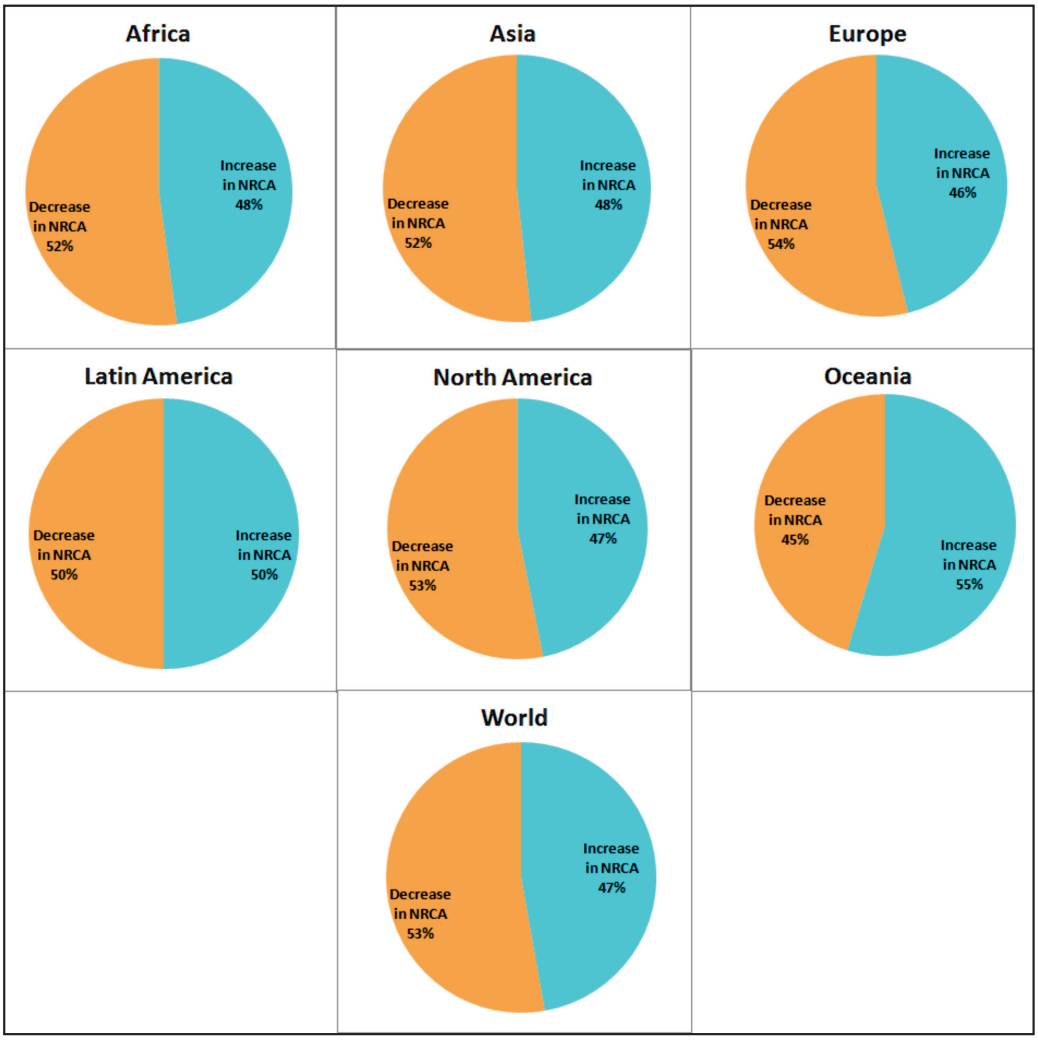
Categories	HS Codes
Primary Materials; Products in Granular or Powder Form	7201, 7202, 7203, 7204, 7205
Iron and Non-Alloy Steel	7206, 7207, 7208, 7209, 7210, 7211, 7212, 7213, 7214, 7215, 7216, 7217
Stainless Steel	7218, 7219, 7220, 7221, 7222, 7223
Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel	7224, 7225, 7226, 7227, 7228, 7229
Articles of Iron and Steel (Other than Tubes, Pipes and Hollow Profiles)	7301, 7302, 7307, 7308, 7309, 7310, 7311, 7312, 7313, 7314, 7315, 7316, 7317, 7318, 7319, 7320, 7321, 7322, 7323, 7324, 7325, 7326
Tubes, Pipes and Hollow Profiles	7303, 7304, 7305, 7306

given in Table 15. The total number of products analysed at HS-6 digit level are 288. Regions of Africa, Asia, Europe, Latin America, North America and Oceania have been taken into consideration.

4.21 Regional and Overall Competitiveness of India's Iron and Steel Exports

Over the period, 2008-2012, India's competitiveness in iron and steel as reflected in the NRCA index, has increased in 47 percent of the products that it exported globally, while it has decreased in the remaining 53 percent of the products. Africa, Asia, Europe and North America have all witnessed the share of products registering an exercise in NRCA being lower than the share of products registering a decline in NRCA during this period. Oceania was the only region to have exhibited an opposite trend (Exhibit 14).

Exhibit 14: Movement in NRCA across Regions for all Iron and Steel Products over the Period 2008-12

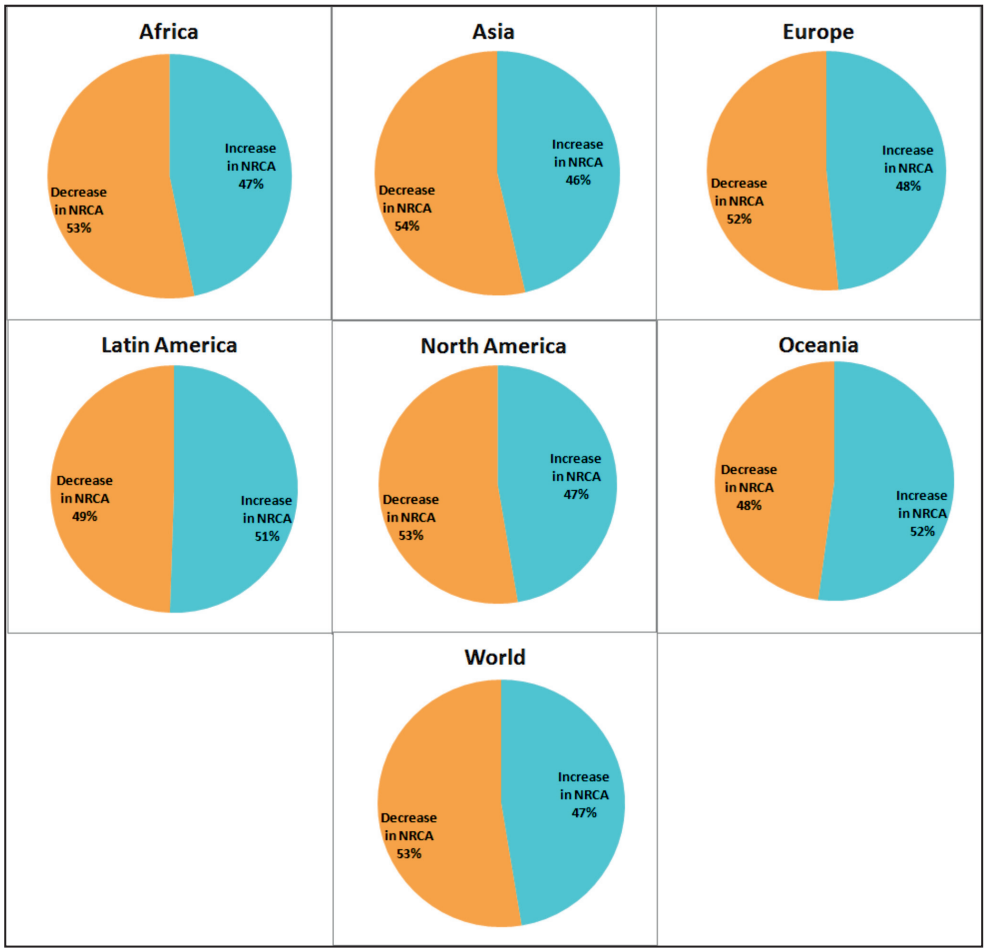


Source: PCTAS, EXIM Bank Research

4.22 Regional and Overall Competitiveness of India's Exports of Articles of Iron and Steel (other than tubes, pipes and hollow profiles)

Over the period 2008-2012, India's competitiveness in the category 'Articles of Iron and Steel (other than tubes, pipes and hollow profiles)' has increased in 47 percent of the products exported by it globally, while it has decreased in 53 percent of the products. In the regions of Latin America and Oceania, the share of products registering an increase in NRCA is greater than those recording a decline. The share of products witnessing an increase in NRCA under this category was 51 percent in case of Latin America, and 52 percent in case of Oceania (Exhibit 15).

Exhibit 15: Movement in NRCA across Regions for Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles) over the Period 2008-12

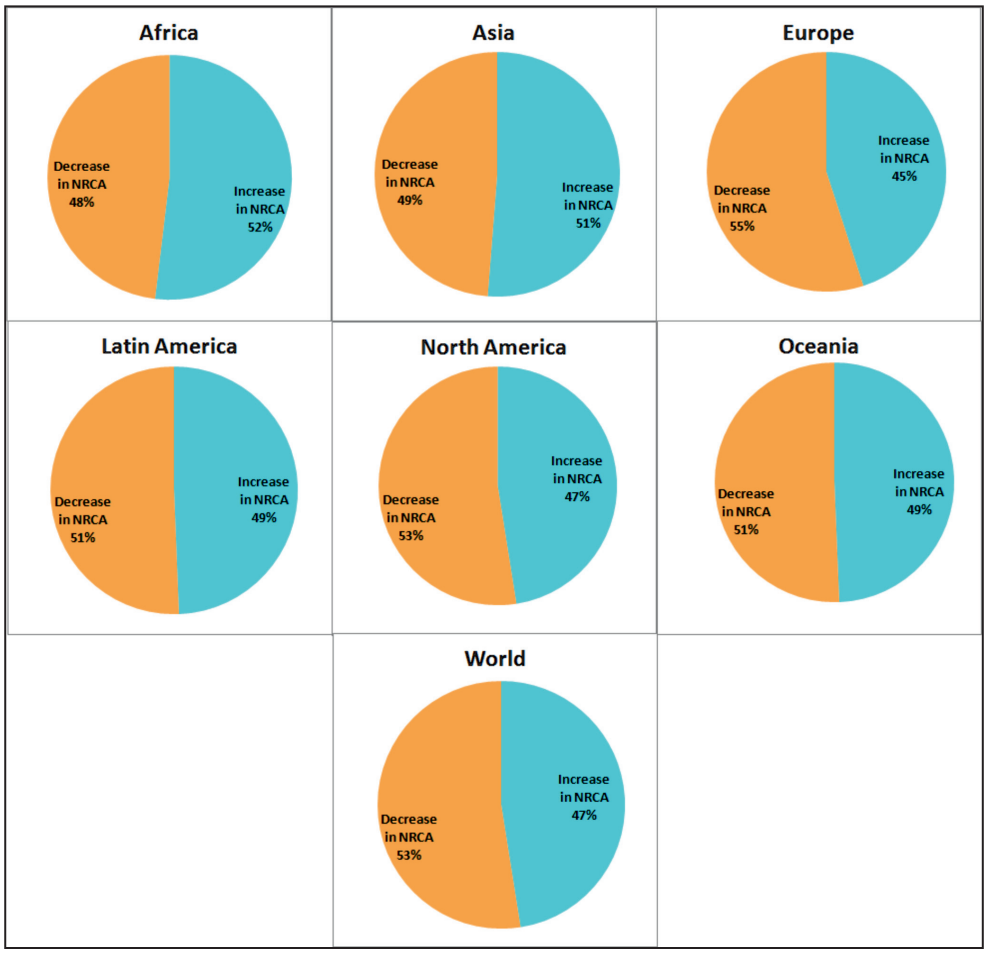


Source: PCTAS, EXIM Bank Research

4.23 Regional and Overall Competitiveness of India's Exports of Iron and Non-Alloy Steel

Over the period 2008-2012, India's competitiveness in the category 'Iron and Non-Alloy Steel' has increased in 47 percent of the products exported by it to the world, while it has decreased in 53 percent of the products. With respect to the regions of Africa and Asia, the share of products registering an increase in NRCA is greater than those recording a decline. The share of products witnessing an increase in NRCA was 52 percent in case of Africa, and 51 percent in case of Asia (Exhibit 16).

Exhibit 16: Movement in NRCA across Regions for Iron and Non-Alloy Steel over the Period 2008-12

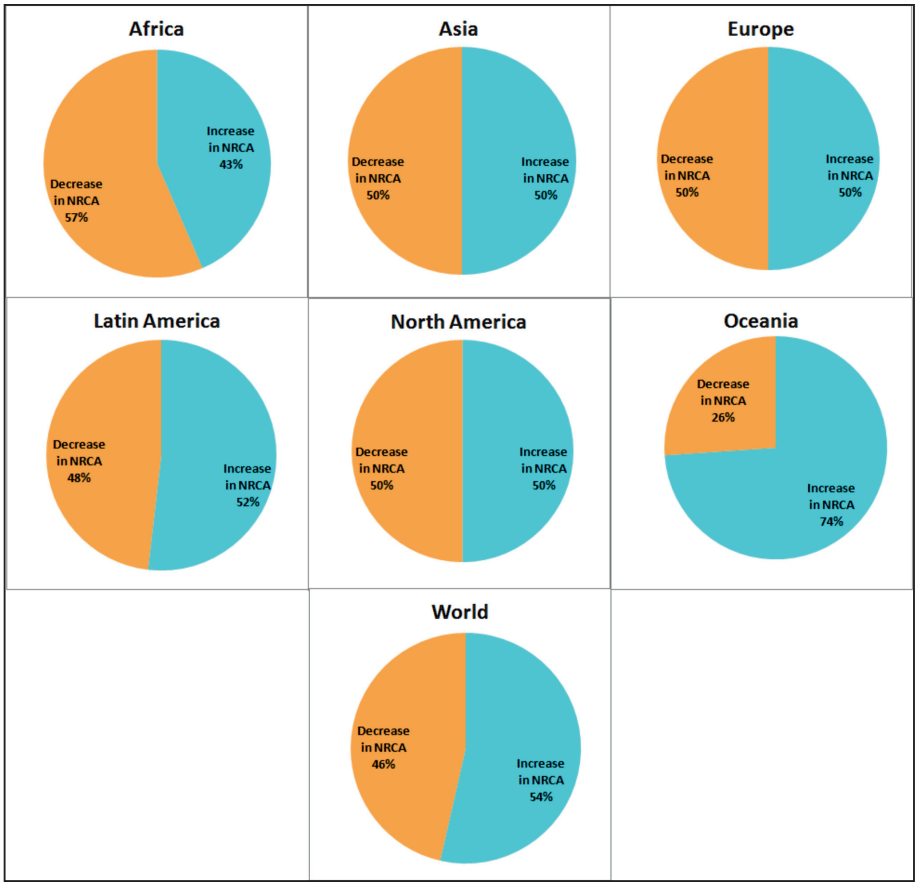


Source: PCTAS, EXIM Bank Research

4.24 Regional and Overall Competitiveness of India's Exports of Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non Alloy Steel

Over the period 2008-2012, India's competitiveness in the category 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non Alloy Steel' increased in 54 percent of the products exported by it globally, while it decreased in 46 percent of the products. With respect to the regions of Latin America and Oceania, the share of products registering an increase in NRCA was greater than those recording a decline. The share of products witnessing an increase in NRCA was 52 percent in case of Latin America, and 74 percent in case of Oceania. In case of Asia, Europe and North America, the number of products registering an increase in NRCA was same as the number of products registering a decline (Exhibit 17).

Exhibit 17: Movement in NRCA across Regions for Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non Alloy Steel over the Period 2008-12

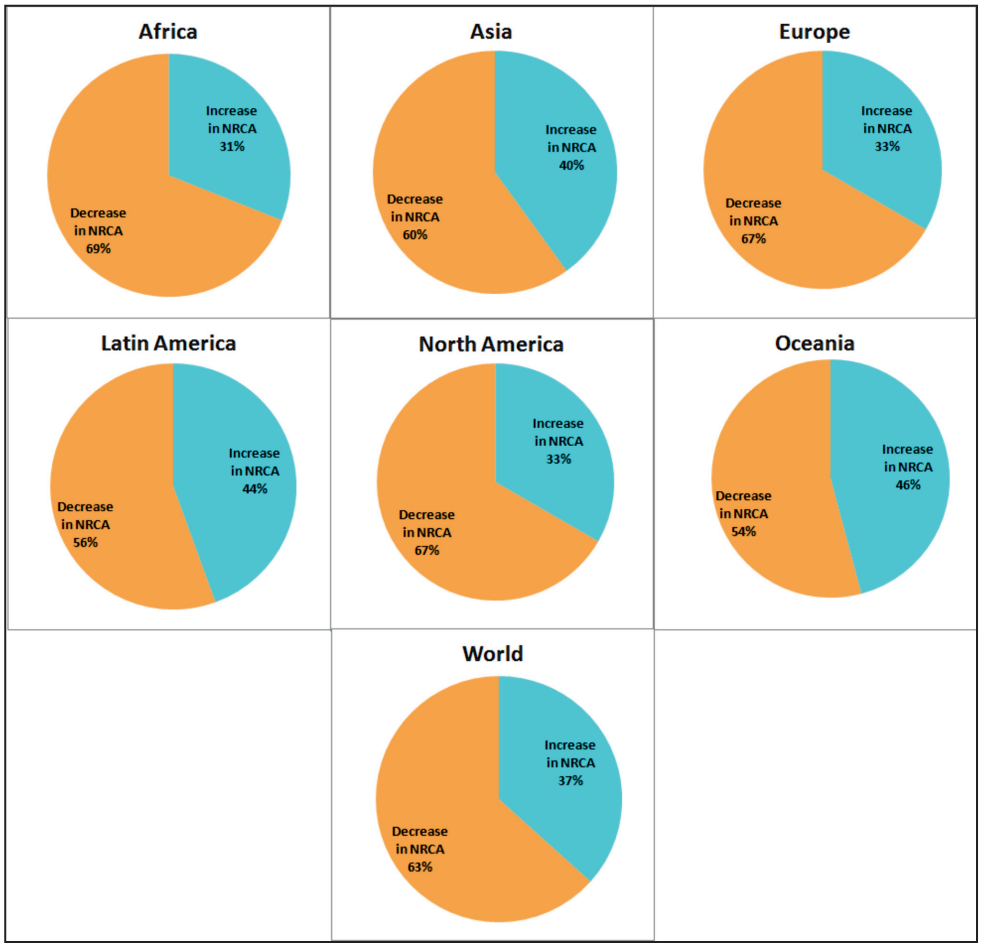


Source: PCTAS, EXIM Bank Research

4.25 Regional and Overall Competitiveness of India's Exports of Primary Materials; Products in Granular or Powder Form

Over the period 2008-2012, India's competitiveness in the category 'Primary Materials; Products in Granular or Powder Form' increased in only 37 percent of the products exported by it to the world, while it decreased in the remaining 63 percent of the products. In all the regions, more number of products exported from India witnessed a decline in NRCA index than those witnessing an increase in competitiveness, with the decline being most precipitous in case of Africa with 69 percent of products registering a decline in NRCA (Exhibit 18).

Exhibit 18: Movement in NRCA across Regions for Primary Materials; Products in Granular or Powder Form over the Period 2008-12

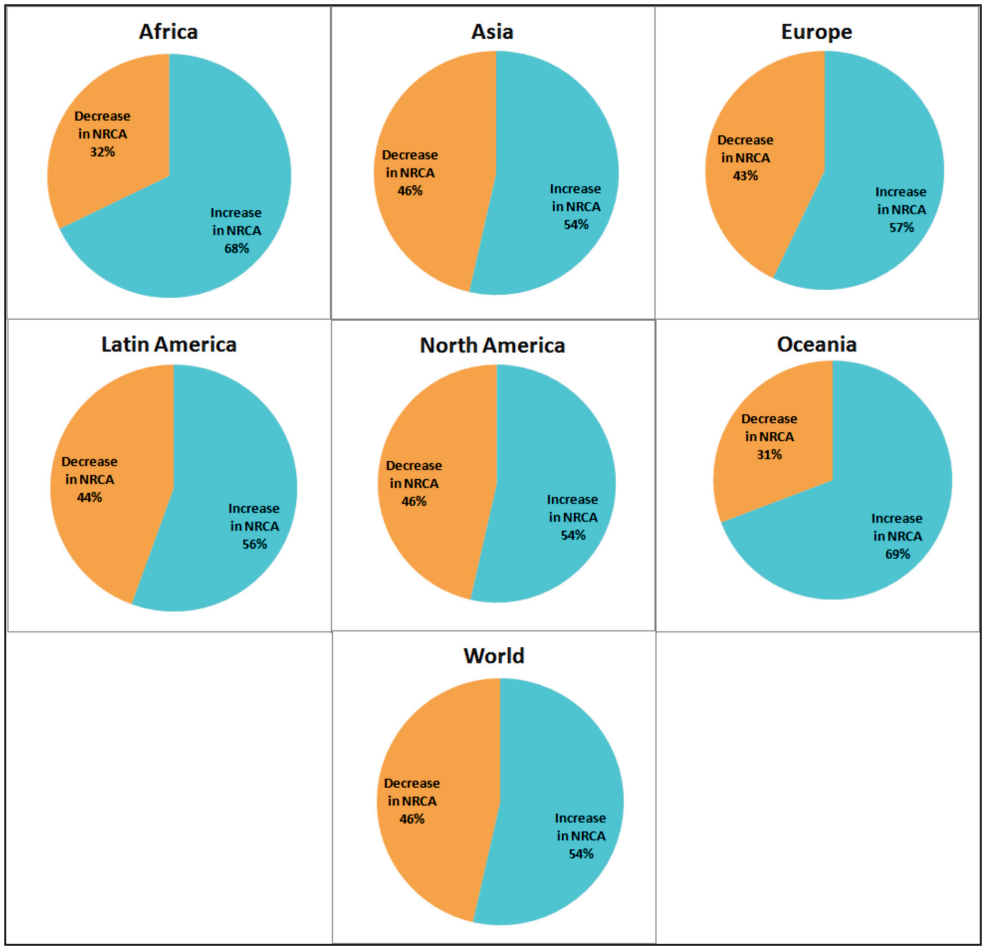


Source: PCTAS, EXIM Bank Research

4.26 Regional and Overall Competitiveness of India's Exports of Stainless Steel

India's competitiveness has increased in the category of stainless steel. Over the period 2008-2012, India's competitiveness in the category of stainless steel increased in 54 percent of the products exported by it globally, while it has decreased in 46 percent of the products. Number of products recording an increase in NRCA was higher than the products recording a decline in all the regions taken into consideration. Maximum increase in NRCA was witnessed in Oceania, with 69 percent of products registering an increase in NRCA, followed by Africa (68 percent), Europe (57 percent), and Latin America (56 percent) (Exhibit 19).

Exhibit 19: Movement in NRCA across Regions for Stainless Steel over the Period 2008-12

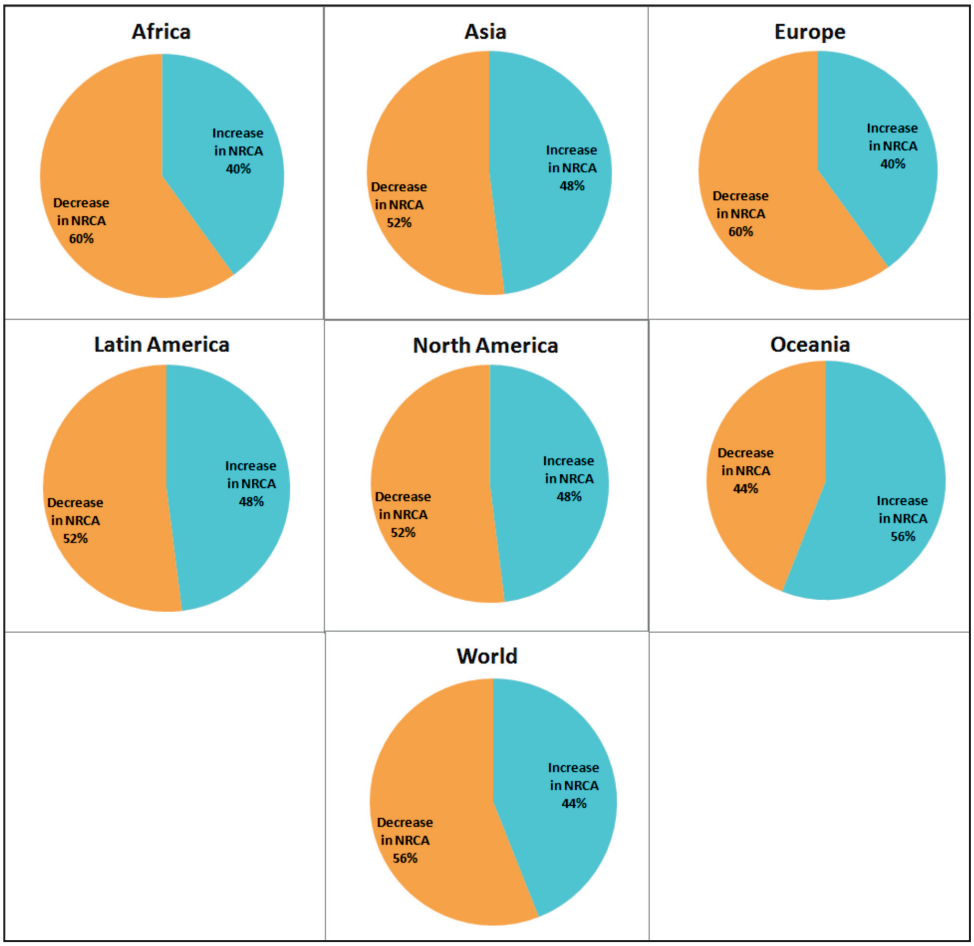


Source: PCTAS, EXIM Bank Research

4.27 Regional and Overall Competitiveness of India's Exports of Tubes, Pipes and Hollow Profiles

Over the period 2008-2012, India's competitiveness in the category 'Tubes, Pipes and Hollow Profiles' increased in 44 percent of the products exported by it to the world, while it decreased in 56 percent of the products. Only in case of Oceania, the share of products having an increase in NRCA at 56 percent was greater than those witnessing a decline.

Exhibit 20: Movement in NRCA across Regions for Tubes, Pipes and Hollow Profiles over the Period 2008-12



Source: PCTAS, EXIM Bank Research

4.3 PRODUCT AND MARKET IDENTIFICATION

An attempt has been made to map the global demand for iron and steel products with India's export competitiveness, with a view to outline a market specific approach for exporters. A generic analysis has been attempted in order to identify products that have strong capabilities to export. Also analyzed are the current export markets where India has penetrated and the key competitors which India faces. While India needs to further consolidate its share in the major import markets, there are markets where India already has export competitiveness, but its imports are at relatively lower levels. These markets are the potential growth drivers for India's iron and steel exports and need to be suitably targeted.

This chapter attempts to identify and categorize the iron and steel products where India could focus on, to realize potentially higher values, especially when considering that the country already possesses manufacturing capabilities for these products. The idea is to construct a product-market matrix for iron and steel products in demand along with the key demand centres (importers), and the key exporters to these regions (India's competitors).

4.31 Methodology:

The analysis in this section considers three major determinants of India's performance in overseas markets, namely:

- The Normalized Revealed Comparative Advantage (NRCA) at the regional level, as discussed in the previous section at the aggregate level for market identification, as well as at disaggregate levels for 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)'; 'Iron and Non-Alloy Steel'; 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel'; 'Primary Materials; Products in Granular or Powder Form'; 'Stainless Steel'; and 'Tubes, Pipes and Hollow Profiles' for simultaneous product and market identification.

- Average Annual Growth Rate (AAGR) of regional import demand at the aggregate as well as disaggregate level.

- Absolute value of regional import demand.

On the basis of these three considerations, a four quadrant bubble chart is prepared for simultaneous product and market identification. The size of the bubble

represents the relative regional import demand of the products. The colour of the bubble represents whether the competitiveness has increased or decreased, with the colour red representing a decline, and green representing an increase. The four quadrants imply the following:

- Product Champions (positive AAGR; positive NRCA): These products have the maximum potential, as the regional import demand in these products has shown robust AAGR over the period 2008-2012, while India's exports of these products to the region are competitive, and the competitiveness has remained same or increased over the period under consideration.

- Underachievers (positive AAGR; negative NRCA): India does not have competitiveness in these products, while their import demand from the region has grown significantly over the period under consideration. India can strive towards increasing competitiveness in these markets for the identified products, especially in cases where the competitiveness as measured by NRCA, has been improving over time.

- Declining Sectors (negative AAGR; negative NRCA): India does not have competitiveness in these products, and imports of these products have also registered weak growth or have actually declined in the region.

- Achievers in Adversity (negative AAGR; positive NRCA): India has competitiveness in these products, but the growth rate in the region for these products has been declining. Indian players can look towards concentrating more on the product champions segment, if there is scope for diversification into other categories of iron and steel production. Else, they can attempt to diversify into those regions where the product category has been witnessing strong import growth rates.

Given that the focus needs to be primarily on iron and steel products which figure under the Product Champions category, a further analysis of this categorization has been undertaken to identify the major importing countries in the regions for these products.

4.32 Aggregate Level Identification of Promising Markets

With respect to all the regions, India's exports of iron and steel products at the aggregate level were competitive. At the aggregate level, the markets

of North America, Latin America, Asia and Oceania are regions where Indian Iron and Steel products are competitive, and these regions have also exhibited strong import demand for the products.

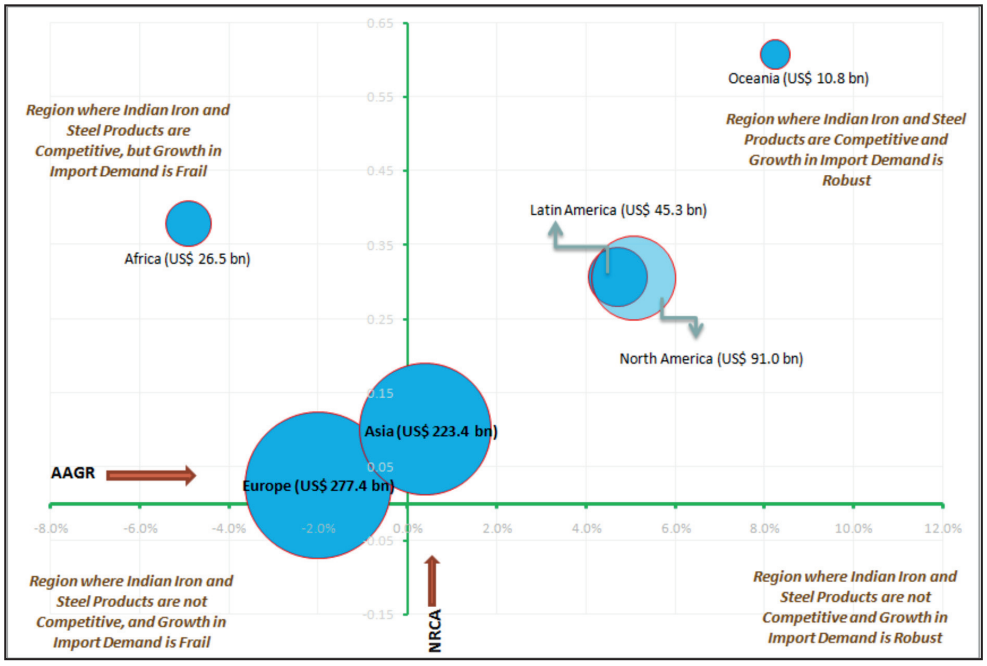
In Europe and Africa, Indian Iron and Steel products are competitive, but the growth in import demand has been frail, which puts forward a case for Indian exporters currently exporting to these regions, to diversify into other regions which have shown better import demand performance (Exhibit 21).

4.33 Disaggregate Simultaneous Identification of Markets and Products

4.331 Africa

In case of Africa, 'Stainless Steel' is a product champion, indicative of simultaneous increase in competitiveness of India's exports, and strong import demand from the region in the product category. However, in certain categories like 'Iron and Non-Alloy Steel', 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-

Exhibit 21: Aggregate Level Identification of Promising Markets



Source: PCTAS, EXIM Bank Research

Alloy Steel', 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)', and 'Tubes, Pipes and Hollow Profiles', India's exports have been regionally revealed competitive in spite of negative growth in import demand of these products from Africa. In the case of 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)', there has also been an increase in export competitiveness of India (Exhibit 22).

In the Product Champion Category of Stainless Steel, South Africa was the largest importer in Africa in 2012, with Taiwan, Sweden, India, Korea Rep., Italy and China being the major suppliers of the product to the country. India was also major supplier to the top importing African countries of Egypt, Morocco, and Ethiopia. Apart from these, India can increase its presence in Algeria (Table 16).

Exhibit 22: Product Matrix at Disaggregate Level for India's Exports to Africa

Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion

Source: PCTAS, EXIM Bank Research

Table 16: Top Importing Countries in Africa for the Product Champion Categories, and their Major Suppliers

Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers
		2008	2009	2010	2011	2012	
Stainless Steel	South Africa	184.6	75.3	139.3	166.5	176.0	Taiwan, Sweden, India, Korea Rep., Italy, China, Germany, Finland, USA, Czech Rep
	Egypt	177.9	101.3	124.0	140.7	153.7	Taiwan, China, Italy, Germany, **India,** Sweden, Turkey, Belgium, Spain, Thailand
	Morocco	50.8	28.5	28.8	54.7	60.0	Belgium, Spain, USA, France, Germany, Sweden, Italy, **India,** Taiwan, The Netherlands
	Ethiopia	22.8	15.3	21.7	23.9	25.3	Turkey, Ukraine, Russian Fed, China, **India,** Israel, Italy, Germany, Taiwan, Peru
	Algeria	28.3	24.8	34.4	59.6	25.3	Spain, Italy, Germany, The Netherlands, France, Taiwan, Turkey, Sweden, Korea Rep., Czech Rep

Source: PCTAS, EXIM Bank Research

4.332 Asia

'Primary Materials; Products in Granular or Powder Form', 'Stainless Steel' and 'Articles of Iron and Steel (Other than Tubes, Pipes and Hollow Profiles)' are the pseudo-product champions in case of Asia. Although India's exports are competitive with respect to Asia in these products and the region's import demand has grown at a robust pace, there has been a decline in India's competitiveness in all these product categories over the period under consideration, reflected in the decline in NRCA index for these products. India's exports have lost competitiveness with respect to the Asian market in all the categories of Iron and Steel exports from India (Exhibit 23).

4.333 Europe

'Stainless Steel' and 'Primary Materials; Products in Granular or Powder Form' are the product categories where growth in import demand of European region has been robust, and India's exports with respect to the region have been

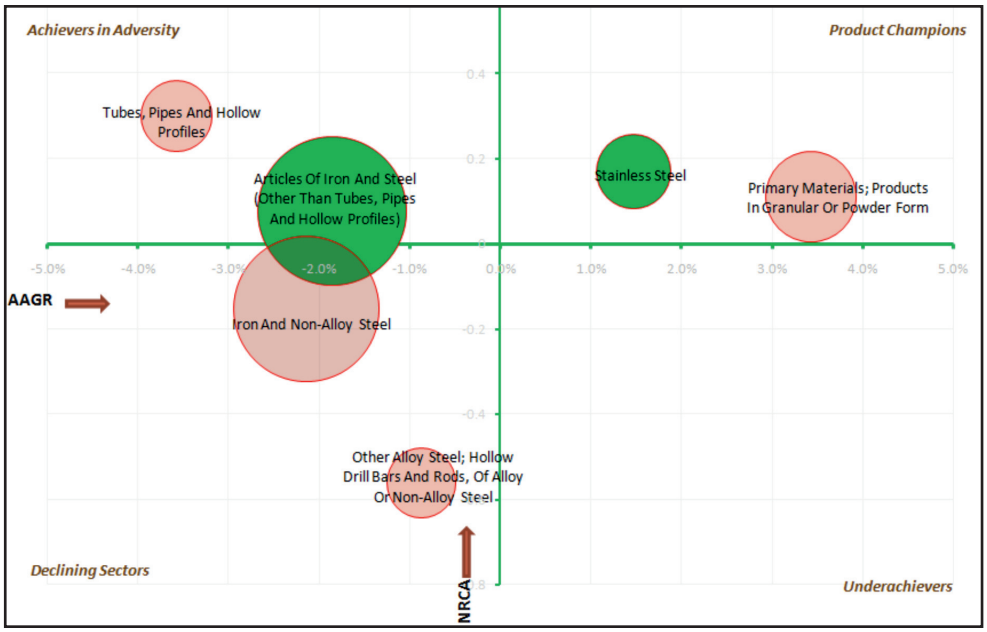
Exhibit 23: Product Matrix at Disaggregate Level for India's Exports to Asia

Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Source: PCTAS, EXIM Bank Research

competitive. However, the latter category has witnessed a decline in competitiveness over the period under consideration. Hence, only the category of 'Stainless Steel' is a true Product Champion. Competitiveness of India's exports has grown in the category of 'Articles of Iron and Steel (Other than Tubes, Pipes and Hollow Profiles)'. However, the category has been witnessing frail growth in import demand in the region during the 2008-12 period (Exhibit 24).

In the Product Champion category of 'Stainless Steel', Germany was the largest importing European country in 2012, with France, Italy, Spain, Sweden and Finland being the major suppliers of the product to Germany. India was the eighth largest import source for Germany. However, India was the topmost non-EU supplier of stainless steel to Germany, and the second largest non-EU supplier to France. India was also the eighth largest import source for the Netherlands, and the country's second-largest non-EU import source for the product. India can expand its export presence in other important countries of Italy and United Kingdom (Table 17).

Exhibit 24: Product Matrix at Disaggregate Level for India's Exports to Europe



Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.

Source: PCTAS, EXIM Bank Research

Table 17: Top Importing Countries in Europe for the Product Champion Categories, and their Major Suppliers

Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers
		2008	2009	2010	2011	2012	
Stainless Steel	Germany	6126.5	2946.6	4525.4	5767.5	4893.9	France, Italy, Spain, Sweden, Finland, Belgium, Austria, **India**, The Netherlands, USA
	Italy	5427.4	2287.8	3901.1	4532.4	3485.4	France, Spain, Finland, The Netherlands, Sweden, Belgium, Korea Rep., Germany, China, Taiwan
	France	3755.5	1822.8	2538.8	2864.9	2422.3	Belgium, Italy, Germany, Spain, Finland, Sweden, USA, Austria, The Netherlands, **India**, United Kingdom
	The Netherlands	2676.7	1349.9	2174.0	2560.6	2352.3	Finland, Germany, Belgium, Italy, France, Sweden, Taiwan, **India**, China, Korea Rep.
	United Kingdom	1600.3	849.0	1169.8	1420.0	1325.0	Germany, Spain, Italy, Finland, Sweden, USA, Belgium, The Netherlands, France, Austria

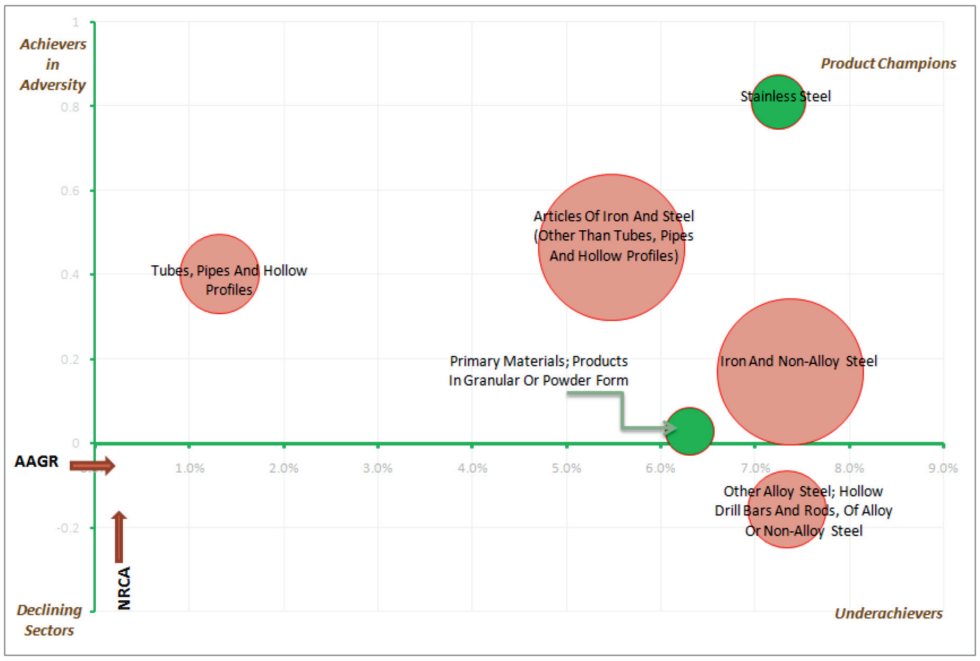
Source: PCTAS, EXIM Bank Research

4.334 Latin America

No product category witnessed negative AAGR for import demand in this region. The product categories of 'Tubes, Pipes and Hollow Profiles', 'Primary Materials; Products in Granular or Powder Form', 'Iron and Non-Alloy Steel', 'Articles of Iron and Steel (Other than Tubes, Pipes and Hollow Profiles)' and 'Stainless Steel' are products where India has competitiveness with respect to Latin America, and the import demand in the region for these products have witnessed strong growth. However, only the categories of 'Stainless Steel' and 'Primary Materials; Products in Granular or Powder Form' are true product champions, as rest of the categories have witnessed a decline in competitiveness during the period under consideration (Exhibit 25).

India has been one of the top suppliers in the Latin American market, of Stainless Steel. All the top five stainless steel importing countries of the region- Mexico, Brazil, Argentina, Colombia and Chile- had India as one of the top ten suppliers in 2012. For Brazil's import of stainless steel, India

Exhibit 25: Product Matrix at Disaggregate Level for India's Exports to Latin America



Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Source: PCTAS, EXIM Bank Research

Table 18: Top Importing Countries in Latin America for the Product Champion Categories, and their Major Suppliers

Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers
		2008	2009	2010	2011	2012	
Stainless Steel	Mexico	1110.0	624.0	1024.2	1157.0	1130.3	Italy, USA, South Africa, Japan, China, Korea Rep., **India**, Germany, Taiwan , Sweden
	Brazil	478.3	240.2	415.5	460.3	447.1	Taiwan , **India**, South Africa, USA, Korea Rep., China, Italy, Germany, Spain, Japan
	Argentina	191.3	85.8	165.3	183.6	176.1	Brazil, Taiwan , Germany, **India**, South Africa, Korea Rep., China, Belgium, Spain, USA
	Colombia	114.7	61.7	88.9	136.4	117.9	Taiwan , South Africa, Finland, **India**, Brazil, China, USA, Germany, Mexico, Korea Rep.
	Chile	97.0	52.2	104.2	114.3	107.9	Finland, China, Spain, USA, South Africa, **India**, Brazil, Sweden, Taiwan, Italy
Primary Materials; Products in Granular or Powder Form	Mexico	996.7	401.8	596.6	775.0	818.0	USA, Brazil, Venezuela, Russian Fed, China, Ukraine, **India**, United Kingdom, South Africa, Korea Rep.
	Brazil	455.2	158.3	330.7	382.4	287.4	Chile, South Africa, Germany, China, France, Norway, Paraguay, Sweden, USA, Argentina
	Peru	165.2	93.6	172.4	134.8	190.4	USA, Brazil, Trinidad & Tobago, Bolivia, **India**, Mexico, Chile, China, Russian Fed, South Africa
	Argentina	333.4	94.5	204.9	175.4	172.9	Brazil, Trinidad & Tobago, Russian Fed, Korea Rep., Chile, Norway, **India**, Germany, South Africa, USA
	Chile	107.0	33.7	53.1	77.7	86.4	Brazil, China, Mexico, **India**, South Africa, Korea Rep., Australia, Turkey, Argentina, Venezuela

Source: PCTAS, EXIM Bank Research

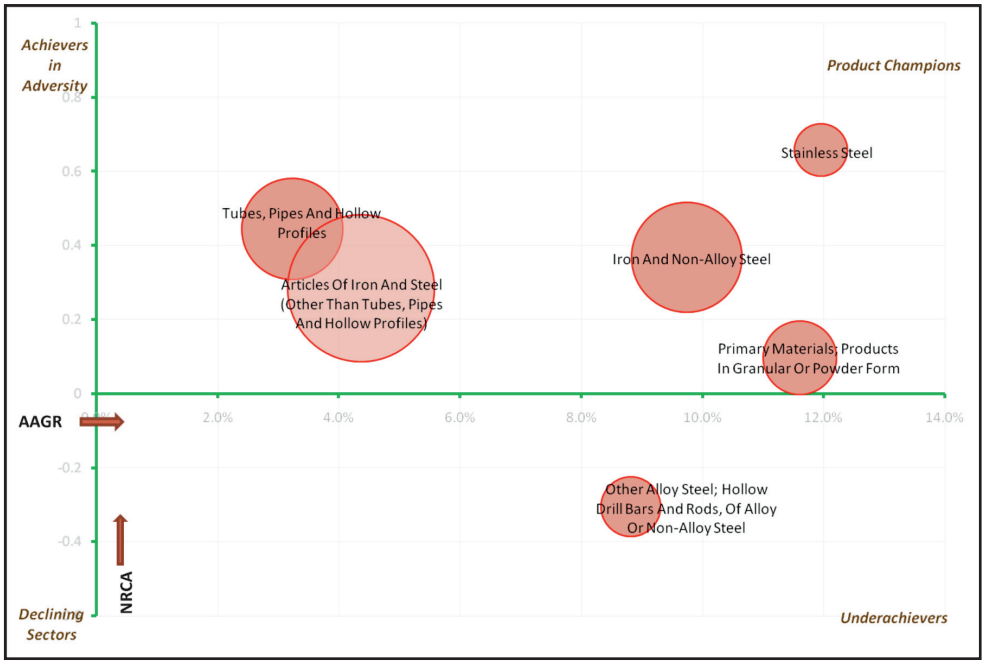
was the second largest import source after Taiwan (Table 18).

In the category of "Primary Materials; Products in Granular or Powder Form" as well, India was an important import source for the region. Except for Brazil, India was one of the top ten suppliers to all the five major Latin American markets (Table 18).

4.335 North America

As in the case of Latin America, no product category witnessed negative AAGR in import demand in North America during the period under consideration. While India's exports in the product categories of 'Tubes, Pipes and Hollow Profiles', 'Primary Materials; Products in Granular or Powder Form', 'Iron and Non-Alloy Steel', 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)' and 'Stainless Steel' are competitive and the demand for these products in the region have been strong, India's competitiveness in these categories with respect to the region have declined in the period under consideration (Exhibit 26).

Exhibit 26: Product Matrix at Disaggregate Level for India's Exports to North America



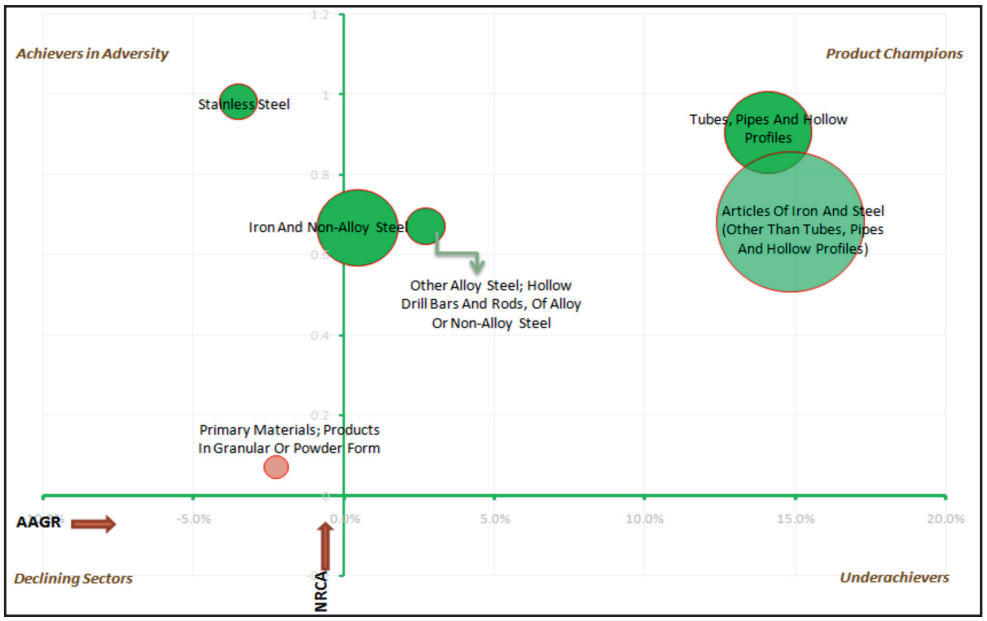
Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Source: PCTAS, EXIM Bank Research

4.336 Oceania

The product categories of 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)', 'Tubes, Pipes and Hollow Profiles', 'Iron and Non-Alloy Steel', and 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel' were the product champions in this region. India's exports with respect to Oceania were also competitive in the categories of 'Primary Materials; Products in Granular or Powder Form', and 'Stainless Steel'. However, the growth in import demand in these categories was frail during 2008-12 (Exhibit 27).

As expected, Australia is the largest market in the Oceania region, where India can attempt to expand its presence. However, India was a major supplier to Australia only in the category of 'Tubes, Pipes and Hollow Profiles'. In the rest three Product Champion categories of 'Articles of Iron and Steel (Other than tubes, pipes and hollow profiles)', 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel' and 'Iron and Non-Alloy Steel', India can explore greater export opportunities in Australia (Table 19).

Exhibit 27: Product Matrix at Disaggregate Level for India's Exports to Oceania



Note: Size of the bubble represents import demand; Colour of the bubble represents increase or decrease in NRCA (Red represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Source: PCTAS, EXIM Bank Research

Table 19: Top Importing Countries in Oceania for the Product Champion Categories, and their Major Suppliers

Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers
		2008	2009	2010	2011	2012	
Articles of Iron and Steel (Other than tubes, pipes and hollow profiles)	Australia	3052.1	2614.4	2844.1	4187.1	4827.2	China, Thailand, USA, Indonesia, Germany, Taiwan , Korea Rep., Japan, Italy, United Kingdom
	New Zealand	509.3	365.4	417.3	491.7	516.5	China, Australia, USA, Taiwan , Germany, Korea Rep., United Kingdom, Italy, Japan, Thailand
	Papua New Guinea	0.0	0.0	0.0	370.8	449.7	Australia, Thailand, Singapore, China, Malaysia, USA, Korea Rep., New Zealand, United Kingdom, Italy
	Fiji	32.1	25.7	26.5	28.6	33.0	China, Australia, New Zealand, Hong Kong, Thailand, **India,** Singapore, South Africa, USA, Malaysia
	Samoa	0.0	3.7	10.7	8.3	10.5	New Zealand, China, Indonesia, Fiji, Thailand, Australia, Malaysia, Japan, USA, Singapore
Tubes, Pipes and Hollow Profiles	Australia	1154.2	1008.6	943.5	1078.4	1779.4	Japan, China, **India**, Malaysia, Korea Rep., Germany, USA, Taiwan , Singapore, Indonesia
	Papua New Guinea	0.0	0.0	0.0	173.2	131.5	China, Singapore, Japan, Mexico, Australia, Thailand, Italy, Germany, Indonesia, Spain
	New Zealand	178.4	111.3	81.7	112.2	129.1	China, Australia, Japan, Taiwan, France, USA, Korea Rep., Italy, Malaysia, Singapore
	Fiji	5.0	3.5	4.6	4.3	3.3	China, New Zealand, Malaysia, Australia, Singapore, Hong Kong, **India**, USA, Japan
	Samoa	0.0	0.5	0.9	0.9	0.7	China, New Zealand, Australia, Hong Kong, Malaysia

Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel	Australia	406.8	267.8	298.4	411.1	367.6	China, Japan, Sweden, Korea Rep., Germany, Spain, United Kingdom, Austria, USA, France
	New Zealand	43.9	24.5	34.3	39.2	32.5	Japan, Australia, Germany, China, Taiwan , Sweden, Korea Rep., USA, Austria, **India**
	Papua New Guinea	0.0	0.0	0.0	25.2	20.0	Australia, Malaysia, China, Thailand, Singapore, Korea Rep., New Zealand, Indonesia, Hong Kong, Canada
	Kiribati	0.0	0.0	0.0	0.0	2.2	Japan
	Samoa	0.0	0.0	0.6	1.1	0.7	China, New Zealand, Malaysia, Thailand, Australia, Singapore
Iron and Non-Alloy Steel	Australia	1847.9	926.8	1299.0	1318.0	1406.9	China, Korea Rep., New Zealand, Singapore, Taiwan , Malaysia, Japan, Thailand, Germany, Indonesia
	New Zealand	353.9	138.8	216.8	235.2	243.9	Australia, Korea Rep., Japan, Taiwan , China, Thailand, Indonesia, Canada, United Kingdom, Singapore
	Papua New Guinea	0.0	0.0	0.0	60.3	66.5	New Zealand, China, Malaysia, Australia, Singapore, Thailand, Taiwan , Hong Kong, Korea Rep., Japan
	Fiji	38.4	20.9	25.9	26.8	28.1	New Zealand, Singapore, China, Australia, Malaysia, Thailand, Hong Kong, Taiwan , Korea Rep., Korea Democratic Rep
	Samoa	0.0	0.3	3.5	3.7	3.4	New Zealand, China, Taiwan , Fiji, Australia, Malaysia, Korea Rep.

Source: PCTAS, EXIM Bank Research

5. THE INDIAN STEEL INDUSTRY: STRATEGIES

The steel consumption growth in India will be based on the trends in population growth, urbanization, mobility and energy costs, including fuels for the transport sector. Further, steel has a strong relationship with manufacturing, and so long as the country's long term growth pattern is not supported by adequate local manufacturing base, steel demand growth will remain limited.

A rapid change in the structure of the economy in terms of changing shares of different major sectors in the economy, viz., agriculture, industry and services will involve a large transformation of the economy and the structure and size of the same will need to be ascertained first, and then the economic opportunities for steel demand growth will have to be identified. It is possible that any economic transformation with rapid growth in manufacturing will trigger steel demand growth much more than estimated so far. If that does not happen and the economy moves along the current path where contribution of manufacturing sector has remained stagnant, the outlook for steel will remain passive. If the process of transformation is delayed, in the global context, the prospects of industrial development in the country will reduce in a relative sense. This will not only lead to loss of opportunities in the world market, but also expose the domestic market to stronger and wider foreign competition. With continuous drop in the share of manufacturing in the economy over the years, the reversal of the trend will be an increasingly stronger challenge and the resources required to bring in the change will also be significant.

5.1 Raw Material Security

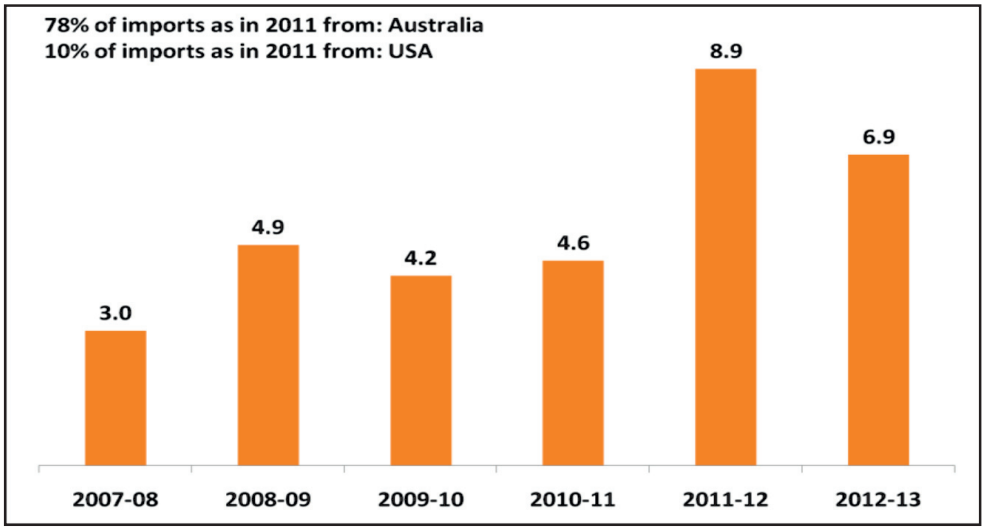
Continous supply of coking coal in desired quality remains a concern because of the depletion of reserves

in many mines. Further, supply bottlenecks in Australia are mounting with floods and bad weather conditions which make delivery difficult even at current levels.

India is very dependent on imported coking coal. Approximately 60 – 65 per cent of the domestic coking coal requirements are met through imports due to unavailability of appropriate qualities in the country. Coal reserves available in the country have high ash content and are not suitable for the steel industry. Planned increases in steel production capacity are likely to be through the blast furnace route, so the requirements for coking coal is expected to increase. In 2012, India imported around 31 million tonnes coking coal, and that amount is expected to rise above 41 million tonnes by 2015[4]. High dependence on imports further makes the domestic steelmakers' profitability dependent on the international coking coal prices.

Raw material security varies widely across the Indian steel companies and is probably the largest differentiator. As these companies look to secure their raw materials supplies, the capability to acquire, develop and operate overseas raw material assets has

Exhibit 28: Coking Coal Import by India (US$ bn)



Source: DGCI&S

[4] Thomson Research

become a strategic imperative given the short term challenges in securing such assets in India. Even where the raw materials are not shipped to India, the overseas asset, act as a natural hedge. Several Indian steel companies have acquired iron ore and coking coal assets in countries such as Canada, Australia and South Africa. One leading Indian steel company acquired a majority stake in a new iron ore reserve in Canada. It had acquired a minority stake in an Australian miner which was sold last year to a leading global miner. Another Indian steel company has acquired and operates anthracite mines in South Africa. It has also acquired a significant minority stake in an Australian coal miner with exploration rights for coking coal in Queensland.

5.2 Trade Agreements Impact on the Domestic Steel Market

The comprehensive economic partnership agreement (CEPA) with South Korea has resulted in increase in imports of iron and steel. India's imports from South Korea of iron and steel (HS Code 72 and 73) has witnessed a more than 35 per cent increase from US$ 1.4 bn as on end-2009 (CEPA became effective January 2010) to US$ 1.9 bn in 2012. In terms of export value of iron & steel, India's export to South Korea lags behind enormously when compared to Korea's exports to India. During the same period 2009 and 2012, India's exports to Korea increased from US$ 185.2 mn to US$ 477 mn. At the same time, the recent free trade agreement with Japan and South Africa enabled imported flat steel material to enter the Indian market at just 3 per cent basic import duty compared to the actual 7.5 per cent duty levied on these products. However, Indian-origin steel was not widely accepted in return by the manufacturing industries of these countries, as they prefer to source material from domestic mills for quality or delivery performance reasons. With the conclusion of the India-Japan FTA in 2011, India faces a similar threat of imports from Japan. It may be noted that India's imports from Japan of iron and steel (HS Code 72 and 73) had already touched US$ 1.8 bn in 2012.

5.3 Near-Shoring Yield Greater Revenues from Exports

Given the fact that steel market across the globe is vulnerable to global economic conditions, India needs to

be more proactive in diversifying its export markets. USA and Europe, the traditional export markets of India, have been offering minimal opportunities for exports due to shrinking domestic demand. The relatively small share of production exported from India has faced competition, particularly from China due to low prices and freight advantages the latter has in some markets. Also, the share of India is very low in most of its major markets.

India could adopt a similar strategy as Brazil, of focusing on geographically nearer markets where it has a freight advantage. At the same time, the country could target other important and growing export destinations for steel sheet products, including the Middle East and Africa, where it has a freight advantage over China, Japan and South Korea. For instance, average freight from Mumbai to Jebel Ali port is around US$ 25-27/t, while shipping from China incurs a freight charge of US$ 45/t[5]. This will allow India to maintain a delivered price advantage, despite a reduction in FOB prices from China in recent years. Indian mills are also able to book much smaller orders compared to the minimum order booking of 15,000-20,000 tonnes from destinations like Japan, South Korea and China, which is valued by the customers. Furthermore, India enjoys freight advantage of minimum US$ 20/t for the East African market, and is already a supplier to smaller African countries which require galvanized material of below 0.3 mm thickness. This can prove to be a useful niche as Chinese mills are more focused on achieving higher volumes and therefore do not offer material with lower thickness.

5.4 Streamling Land Acquisition and Environment Regulations

A number of existing legal and statutory regulations and government policy guidelines are of crucial relevance to the steel industry. Some of the important ones amongst these include those linked to allocation of mining leases, environmental and forest clearances, quality control and the policy on resettlement and rehabilitation etc. Setting up a steel plant requires vast tracts of land. Acquiring these vast tracts of land for setting up mega-plants, particularly in a populous country like

[5]CRU Research

India, has remained a challenge for steelmakers. India needs to simplify its processes for land acquisition, allocation of mines, as well as granting environment and forest clearances to lend certainty to execution of big projects. Major Greenfield steel projects have witnessed a delay for a number of years primarily due to land acquisition issues. For example, POSCO's proposed steel mill in Orissa which required around 1,600 hectares got approved after almost 8 years. Rules to calculate adequate compensation to the landowners have been unclear. Additionally, the number of approvals like environmental and forest clearances required from the authorities has made land acquisition and setting up projects the top issues in building up large new capacity. Simplification of the process of land acquisition, expediting the process of environmental and forest clearances and putting in place a mechanism for mining allocations, will give the required impetus to steel investment plans and lend certainty to project execution.

5.5 Creating Infrastructure and logistics for Steel Industry

The steel industry is a major user of infrastructure resources like railways, roads and ports. Every 1 tonne of steel produced involves approximately 4 tonnes of material movement across India. Growth in steel production will increase the burden on the country's already stretched logistics infrastructure. To meet the needs of a growing steel industry, major improvements in various infrastructure facilities are required. The Indian railway system suffers from a lack of adequate haulage capacity and has significantly low heavy-haul freight compared to its global peers. For example, Indian Railways' heavy-haul freight at 5,400 tonnes is much lower than that of other countries such as China (20,000 tonnes), South Africa (22,000 tonnes) and Australia (32,000 to 37,000 tonnes)[6]. Indian Railways also suffers from inadequate infrastructure at various loading and unloading terminals. The freight car turn-around time is very slow by global standards. The effective freight rates continue to carry an increased burden of subsidy towards passenger traffic.

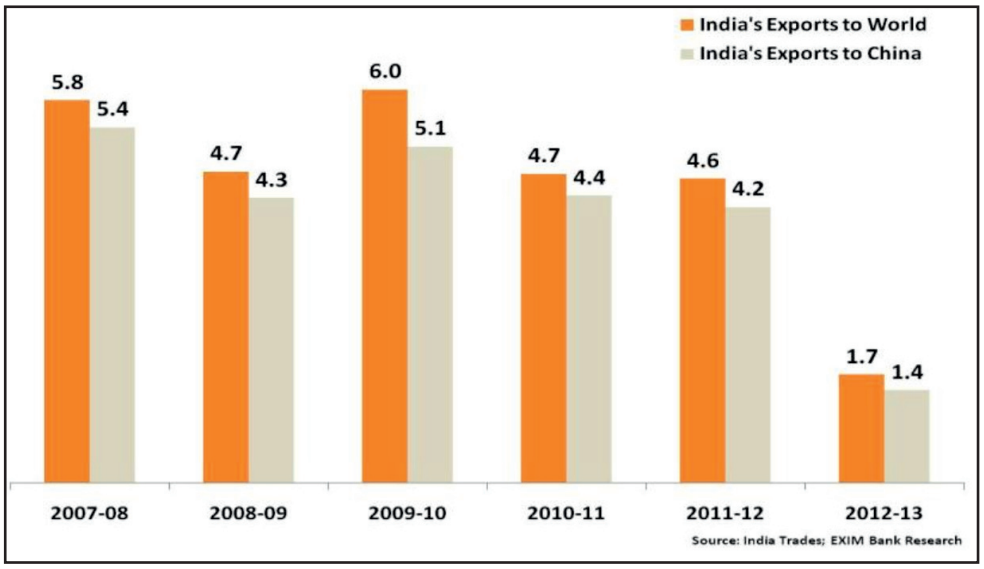
[6] Ministry of Indian Railways

5.6 Limiting Exports of Iron-Ore

Iron ore prices are likely to remain under pressure in the world market due to abundant supplies and reduced demand. The boom in the industry in the last decade led to massive investments in iron ore mining and by the estimates available as on date, over 1.5 billion tonnes of iron ore mining capacities are getting added in the coming years before 2020. The consequences of this development can be either the financial bankruptcy of the iron ore players, especially the new ones, who invested at higher valuation of iron ore prices, or that they continue to produce as per the market demand and continue to sell at marginal costs. While this is good for the steel makers, those in the industry who either have captive mines or have recently invested on them will see their economics weakening. However, a counter argument is that the iron ore resources in China, and even in India to an extent, may be sufficiently depleted by then due to high steel production and therefore, one would expect high prices of iron ore on the international market in the years ahead to continue.

The country has at present an estimated iron ore production capacity of about 300 million tonne, which is about three times the present domestic consumption of iron ore. The last decade has seen a rapid increase in production of iron ore in the country, primarily due to a lucrative export market fuelled by insatiable

Exhibit 29: India's Exports of Iron Ore: World and China (US$ bn)



demand of ever expanding Chinese steel industry. During 2012-13, export of iron ore declined, mainly due to restriction on exports by Karnataka and the fiscal measures taken by the Government for restricting the export of iron ore. In fact, as per projections, present known reserves may not last beyond the next twenty years unless special efforts are made to augment the country's reserves. It may be noted here that these projections do not include the amount of iron ore, which will be exported out of the country. If the export of iron ore continues as per the present trend, the reserves of iron ore will be exhausted even earlier.

5.7 Cost Reduction to Improve Margins

Steel companies globally have been operating in a challenging environment of rising input costs and limited pricing power, leading to steady erosion in margins. In response, steel makers have been integrating upstream facilities to secure supplies of iron ore and coking coal. To ensure a competitive advantage, steel makers have to concentrate on reducing costs, especially operating costs. The cost reduction would be the main aspect of the improvement pertaining to the competitiveness of the industry. Operating costs need to be brought down by adopting strict cost control measures and through benchmarking. Another major cost that needs to be looked into is the cost of raw material. The only way to reduce costs on these is using raw materials more efficiently, which can bring significant cost savings.

It may be mentioned here that reducing inventory, transportation and processing costs, freight costs, etc are some of the other ways by which the company can increase revenue. For example, North India has not been naturally endowed with rich iron ore and coal deposits like East or South India. Poor proximity to ports, higher cost and shortages of power do not favor setting up primary steel manufacturing units in the region. Moreover, the logistics cost of transporting raw material from the eastern and southern states make it unviable to produce crude steel in the region.

5.8 Improving Port Facilities

As steel capacity in the country grows, the industry will be increasingly dependent on domestic ports for material movement. Projected traffic handled by major and minor ports for iron ore is expected to rise from 138 million tonnes in 2011–12 to around 245 million tonnes by 2016–17, while traffic for coal (coking and non-coking coal) is projected to increase from 163 million tonnes in 2011–12 to

around 544 million tonnes in 2016–17[7]. Port capacity may not increase at the same pace, as there have been delays in implementing current projects, further limiting the ability to propose new projects.

5.9 Reducing Procedural Delays

The existing process of securing statutory clearances for commencing mining operation, right from the stage of applying for the reconnaissance permit to getting the mining lease, incorporates a series of lengthy procedures at both the State and Central level, leading to massive delays in commencing mining operations. The delays are as much as 5-7 years in India as against normal time of 12 months in countries like Australia, Canada etc. This is reflected in the fact that despite 200 MOU's being signed by investors with the States, not many major greenfield projects has come up in the recent past. These procedural delays have proved detrimental to the growth of the steel industry in the country.

5.10 Competition from Substitutes

Steel industry is inevitably going to face competition from other industries, as technology improves. For example, the steel industry will increasingly come under threat from substitute materials such as aluminium (in specific areas with long product life such as buildings, infrastructure, automobiles, etc.) and plastics (construction, pipes, consumer durables, appliances, etc. irrespective of product life). Future products are being developed considering the low cost alternatives and energy considerations. Therefore, steel intensity in the economy may not see an increase as expected.

Indian steel companies therefore may need to upgrade their product and service offerings to target more sophisticated customers, such as auto original equipment manufacturers (OEM). This includes establishing wider conversion and coating lines (e.g.,Galvalume) and forward integrating into service centers to meet OEM demand for value-added products (e.g., tailored blanks, laser welded blanks). In addition to value-added products, customers also are expecting higher service components like vendor-managed inventory and more responsive supply chains with lower order-to-delivery lead times. As these customers expect tailored value propositions that best suit their requirements, Indian steel companies would be forced to enhance the value-added products in their portfolios and focus on delivering desired service levels to the end customers. For instance, OEMs are demanding (and

[7]Report of the Working Group on Port Sector for the 12th 5-year plan, Ministry of Shipping, Government of India

obtaining) delivery lead times of less than 30 days from new entrants.

5.11 Price Sensitivity and Demand Volatility

Steel Industry always runs risk of industry cycle. Input price sensitivity and demand volatility are an inherent business risks. Companies have to undertake continuous development, training and modernization programme to keep its business efficient. Managing the increased volatility in raw materials prices has become a major day-to-day challenge for steelmakers. Such fluctuations tend to erode the investor confidence in the industry's ability to manage the spreads between input costs and output prices, which are essential to generate adequate returns over the cycle. Similarly, as regards the other major raw material, viz. coking coal, poor domestic availability, as well as quality problems of domestic coal has forced the steel industry to import coking coal, thereby making them susceptible to the vagaries of the fluctuating international coking coal prices and adversely affecting their competitive position. Even as the mining industry adds more capacity in the coming years, the industry structure and market dynamics are expected to remain more or less the same. In this context, all steel producers, even those with some measure of self-sufficiency, need to look to other mechanisms to manage volatility.

5.12 Encouraging Steel Futures Market

The steel futures market is a 'new reality', which could bring stability in pricing, offering certain uses to steel producers as well as consumers. Futures contracts are financial risk management tools that enable companies to hedge their price risk exposure by agreeing to buy or sell a particular volume of product for delivery on a fixed date at a price agreed today. The advantages of having a steel futures market would be that it ensures price transparency and the transparent prices would facilitate external and internal negotiations with other market influencers such as unions and governments. Experience in other markets such as oil and aluminum shows that there is a high correlation between spot prices of different related products. In the case of steel products this could mean that a futures contract for one product, e.g, HR coils could be used as a reference quotation price for other products such as cold rolled coils or slabs with a premium or discount. For similar reasons, the management of raw materials relationships could also be made easier for e.g. iron ore contracts could be linked to the price for HR coils on an exchange, hence protecting margins.

Steel futures will also help in rendering decision-making process easier and will help producers to plan their

capacity in a better way, as they are sure of the future. Therefore, steel futures would be healthy for the industry, as it would help in potentially increasing the capital available and also reducing the cost of capital, and thus improving profitability. In India, two exchanges currently offer steel futures contracts - MCX (for steel ingots and HRC) and NCDEX (only steel ingots) - but trading is very limited.

5.13 Introducing New Product Lines

Indian steel industry need to concentrate more on providing new generation products that maybe in demand in future. There are thousands of different types of steel, designed to meet the specific needs of end users. Many of the products were developed in the last ten years. Safety requirements, cost restrictions, structural performance demands innovations in steel production. In addition, increasing environmental pressures lead to innovation in steel manufacturing technology, as also design and applications in end user industries. For example, advanced high-strength steels are helping carmakers meet the performance demands with affordable solutions. With the rising climate change concerns, the next generation automobiles would include alternative powertrains, such as hybrids and fuelcells. Steel producers have developed UltraLight Steel AutoBody, which has achieved 25 per cent reduction in vehicle mass, re-establishing the position of steel as a viable light-weight material for the automotive market. In such companies, there is a new thinking which clearly states that accidents are avoidable and 'accident free' steel is the practical goal of the future Similarly, the World Steel Association has initiated a new project called 'Living Steel' to stimulate innovation in design, supply and use of steel in construction. Indian steel producers should also concentrate on producing new generation products to be competetive globally.

5.14 Steel Plants to Meet Global Standards

Steel is a highly capital and technology intensive sector. Therefore sustained and consistent improvements in parameters of technical efficiency has become vital, specially in areas where the industry is lagging behind. Technological developments are more likely to be seen in mining of both iron ore and coal, use of coal and production of iron. The steel industry will have to cater to the requirement of the technology changes in the end use areas. Demand for lighter and stronger steel will require technology change in steel making and rolling. Technology change in product areas will require high investment and not all the steel

producers will be able to respond to it quickly.

In India, such problems are mainly related to obsolescence of technology adopted and lack of timely modernisation / renovation, quality of raw material and other inputs, inefficient shop floor practices, lack of automation and R&D intervention. This has affected various critical performance parameters for steel plants, including blast furnace productivity, coke rate, energy consumption and blast furnace slag volume. Concerted efforts with well thought out programme of action are therefore necessary to bring the Indian steel industry at par with their counterparts abroad. Table 20 briefly mentions about the performance of Indian steel plants as compared to global parameters.

The specific areas requiring immediate attention include areas of process improvement, automation, use of inferior raw material, beneficiation, energy conservation and use of waste material. While for some of these problems, the industry is in search of innovative and cost effective solutions, there exists proven technologies in certain other areas. These technologies/practices have been already operating successfully abroad and need to be adopted and assimilated by the Indian industry at an accelerated pace. While adoption of proven technologies may result in immediate gains, there is a need to encourage those technologies which though are not yet commercially proven but are consistent with the resource endowment of the country. The use of steelmaking technologies such as FINEX[8] and ITmk3[9] need to be encouraged. This will also lead to an improvement in consumption of raw materials and energy, as well as compliance with environmental and pollution benchmarks such as carbon emission norms.

[8]FINEX is the name for an iron making technology developed by Siemens VAI and POSCO. Molten iron is produced directly using iron ore fines and non-coking coal rather than traditional blast furnace methods through sintering and reduction with coke. Elimination of preliminary processing is claimed to make the plant for FINEX less expensive to build than a blast furnace facility of the same scale, additionally a 10-15% reduction in production costs is expected/claimed through cheaper raw materials, reduction of facility cost, pollutant exhaustion, maintenance staff and production time. The process is claimed to produce less pollutants such as sulphur-di-oxides, nitrogen-di-oxides, and carbon dioxide than traditional methods.

[9]Development of direct iron reduction process based on coal, called ITmk3 (Iron-Making Technology Mark "3"), has been started by Japanese company Kobe Steel, Ltd in 1996. The objective was to create a modern technology to produce high quality products for metallurgical industry with successive significant reduction in production costs and lower environmental hazard. It is a simple process with a single-step furnace operation. It uses rotary hearth furnace (RHF) to transform iron fines and pulverized coal into iron nuggets. Reduction, melting and slag separation completes within ten minutes.

Table 20: Performance of Indian Steel Plants as compared to Global Parameters

Item	Unit	Unit	Global Benchmark	Indian Steel Plant
Blast Furnace Productivity	($t/day/m^3$)	Tonnes of hot metal produced per day, per cubic meter of blast furnace volume.	2.5-3.5	1.5-2.5/2.8
Coke rate	(kg/t-HM)	Kilograms consumed per tonne of hot metal produced	350-400	500-600
Pulverized Coal Injection	(kg/t-HM)	Kilograms consumed per tonne of hot metal produced	150-250	50-100
Blast Furnace Slag Rate	(kg/t-HM	Kilograms consumed per tonne of hot metal produced	200-300	300-400
Energy Consumption	(Gcal/TCS	Giga calorie per tonne of crude steel produced	4.4-5.5	6-6.5
Steel making slag rate	(kg/TCS)	SMS slag consumed per tonne of crude steel	< 100	180-200
CO_2 emission	(t/TCS)	tonnes of CO_2 emitted per tonne of crude steel	1.7-1.9	2.8-3.0

Source: IISA as quoted in report of the Working Group on Steel Industry for the 12th FYP

5.15 Recycled Steel

In the United States, steel is the most widely recycled material because it is economically advantageous to do so. It is cheaper to recycle steel than to mine ore and manipulate it through the production process to form steel. Steel does not lose any of its inherent physical properties during the recycling process, and has drastically reduced energy and material requirements compared with the refinement from iron ore. The Steel Recycling Institute (SRI), a unit of the American Iron and Steel Institute, is an industry association that promotes and sustains the recyling of all steel products. The North American steel industry annually recycles millions of tons of steel scrap from recycled cans, automoblies, appliances, construction and other steel products. This scrap is remelted to produce new steel. India should also adopt techniques of recycling steel, in order to reduce cost of production and wastage.

5.16 Steel-Servicing Centres

Most of the steel plants have the capability to produce in small tonnages in varied sizes, but usually production is done in large lots in order to minimize cost by taking advantage of economies of scale. Steel service centres can act as a savior here for those end users who want to reduce their own financial investments by getting the material they want without spending on equipment and machinery. Steel service centres are processing and distributing intermediaries who act as a bridge to meet the gap between steel makers and customers by processing steel into small sizes as generally required by the small or medium customers. Steel service centers specialize in the processing of steel for the purpose of fabricating, plating, or molding much needed parts such as steel bars, balls, tubing, gates, walkways, beams, coils, sheets, and strips. In essence, steel service centers manipulate and treat steel to create items useful by almost every industry by providing specialized finishing and processing services. Hence, the setting up of such service centres should be encouraged for better customer satisfaction and increased production.

5.17 Branding

Branding has gained prominence in India over the last few years, and the promise of better brand and possibility of companies leveraging this to ensure higher brand loyalty amongst its customers, has led to a number of steel manufacturers taking tentative steps towards establishing their own labels. Brands give an otherwise indistinguishable product a new identity and they serve as a mark, an assurance of quality and allow the company concerned to charge a premium for the products after consumer acceptance. Some of the prominent steel brands in the market are Tata Tiscon, Tata Shaktee GC Sheet; SAIL's Salem Stainless, SAIL Jyoti, SAIL TMT; and Essar's 24-Carat Steel. The incidence of branding has been limited to few of the top integrated players. Indian companies should be encouraged to brand their products for better prospects in the future.

5.18 Human Resource Development

In order to make the plans of raising production, master sophisticated technology and for achieving market leadership, it is necessary to have adequate human resources with superiority in skills, knowledge and resources. It is competent manpower that would ultimately give the industry the competitive edge. This competence defined in terms of ability to achieve predetermined goals must be supplemented with a conducive

environment for work, systems that enable employees to perform better and processes that help them to ensure maximum productivity at work place.

5.19 Establishing a Steel Research Institute

While Government owned steel behemoths like SAIL have their own state of art infrastructure dedicated to R&D in steel, (for example, Research and Development Centre for Iron & Steel (RDCIS) based in Ranchi), a national level institute catering to R & D in Steel seems lacking. Government of India has recently announced the Steel Research & Technology Mission of India (SRTMI) under 'Make in India, Made in India' initiative. Under this initiative, it is suggested that a country level national institute be established to promote collaborative research programmes in steel sector. Investment on R & D in the steel sector must increase from present level of 0.2-0.3 % of turnover to international benchmark of 1-2 % of turnover by the leading companies. The institute could carry out R&D in priority areas of national importance covering best usage of available raw materials and conservation of natural resources, optimum energy conservation and minimum emissions leading to innovations, and in-house development of design, engineering and manufacturing facilities of key steel plant equipment.

5.20 Diversification of Exports in the Product Champion Categories

In order to maintain the momentum in exports in the years to come, Indian exporters need to follow a more pronounced market oriented strategy. This includes identifying potential markets for the steel produced in our country. Given the variety of steel products both in terms quality and its end usage, it becomes important for the steel producers in the country to identify the target markets across the world so as to maximize their returns from their exports.

India needs to further consolidate its share in the major import markets, where India already has export competitiveness. Based on the analysis conducted in the current study, the identified products and markets are 'Stainless Steel' in Africa and Europe; 'Stainless Steel' and 'Primary Materials; Products in Granular or Powder Form' in Latin America; and 'Articles of Iron and Steel (other than Tubes, Pipes and Hollow Profiles)', 'Tubes, Pipes and Hollow Profiles', 'Iron and Non-Alloy Steel', and 'Other Alloy Steel; Hollow Drill Bars and Rods, of Alloy or Non-Alloy Steel' in Oceania.

OUTLOOK

Given the overall scenario presented in terms of steel demand growth prospects, raw materials availability and the policy concerns therein, infrastructure shortages and the required actions, manpower development needs, and industry actions needed in respect of technology induction and enhancement of overall productivity and efficiency, the government actions and policies will have to strategized appropriately so that the development of the industry takes a smooth course.

Infrastructure, automobiles and consumer durables are the main drivers for growth of steel industry. While near-term demand is expected to remain muted, long-term prospects are forecast to be steady. The domestic steel demand is expected to pick up gradually with an expected pickup in demand in key end-user sectors such as construction, infrastructure and automobiles. The profitability of the Indian steel industry is likely to come under pressure due to deterioration in the demand-supply equation on the back of macroeconomic challenges being faced by the country. The issues confronting the industry needs to be addressed in areas of non-availability of raw materials, high price volatility, growing raw materials prices, cheap imports, environmental issues and lack of demand.

Taking an optimistic yet reasonable view of the growth of the economy, the steel demand in the country can be expected to grow sufficiently to support the production of 300 million tonnes of crude steel by around 2030-2033. If the production capacity is built earlier, the industry will then have to depend on the world market which will remain challenging if the competitive strength of the industry is not enhanced remarkably and to its full potential. To maintain production at 300 million tonnes plus levels will require extensive efforts in the areas of mining of iron ore, coal, manganese ores, etc. to boost their production and ensure that the steel industry finds these raw materials at competitive prices. It is fairly easily understandable that raw materials remain the basic advantage for the Indian steel industry and in the absence of their easy and low cost availability, the steel producers will face high costs of production and remain globally uncompetitive.

With the natural advantages taken away, and given the fact that with increased globalization and lowered trade barriers, the steel industry faces strong competition from imports, the domestic market will no longer remain a comfortable place for the domestic industry. Similarly, there is a need to develop infrastructure to support steel industry's growth especially in the areas where steel plants are likely to be located.

ANNEXURE 1: APPARENT CONSUMPTION OF FINISHED STEEL (MILLION TONNES)

Year	Apparent Consumption (+/- variation)
1991-1992	14.83
1992-1993	15.81 (6.6%)
1993-1994	16.11 (2.0 %)
1994-1995	19.55 (21.3 %)
1995-1996	22.37 (14.4 %)
1996-1997	23.29 (4.1%)
1997-1998	23.80 (2.2%)
1998-1999	24.71 (3.8%)
1999-2000	26.34 (6.6%)
2000-2001	27.64 (4.9%)
2001-2002	28.52 (3.2%)
2002-2003	30.67 (7.6%)
2003-2004	33.11 (8%)
2004-2005	3637 (9.8%)
2005-2006	41.43 (13.9%)
2006-2007	46.78 (12.9%)
2007-2008	52.12 (11.4%)
2008-2009	52.35 (0.4%)
2009-2010	59.33 (13.3%)
2010-2011	66.42 (11.9%)
2011-2012	71.021 (6.92%)
2012-2013	73.482 (3.5%)
2013-2014	73.895 (0.6%)

Source : JPC

ANNEXURE 2: NORMALIZED REVEALED COMPARATIVE ADVANTAGE OF INDIA'S EXPORTS IN REGIONS

		Africa		Asia		Europe		Latin America		North America		Oceania		World	
HS Codes	HS Description	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012	NRCA 2008	NRCA 2012
720110	Pig iron ,non-alloy, containing by weight </=0.5% phosphorus in primary form	0.4890	-0.1007	0.9478	0.8353	0.5329	0.1470	-0.3175	-0.3955	0.9174	0.8615	0.8091	0.9997	0.60	0.30
720120	Pig iron, non-alloy, containing by weight >0.5% of phosphorus in primary form	0.9963	-1.0000	0.9547	-1.0000	0.9826	-1.0000		-1.0000	0.9997	-1.0000		-1.0000	1.00	-1.00
720150	Alloy pig iron, spiegeleisen	0.9631	0.5301	0.9381	0.6925	0.8996	0.1116	0.9950	0.9921	0.9676	0.8686			0.90	0.40
720211	Ferro-manganese, containing by weight more than 2% of carbon	-0.1869	-0.3745	0.8422	0.8778	0.8586	0.8473	0.8696	0.9316	0.9577	0.9392			0.80	0.80
720219	Ferro-manganese, nes	-0.4841	-0.6899	0.2483	0.4172	0.6981	0.6042	0.5371	0.4729	0.8833	0.8631	0.9753	0.9788	0.40	0.40
720221	Ferro-silicon, containing by weight more than 55% of silicon	0.2076	0.1205	-0.1686	0.0154	0.0847	-0.4353	0.0002	-0.4003	0.7672	0.4810	0.9981	0.9810	0.00	-0.20
720229	Ferro-silicon, nes	0.0020	-0.6376	0.6872	-0.0899	0.6288	-0.5060	0.1054	-0.4506	0.4226	-0.4508	0.9234	0.9226	0.50	-0.40
720230	Ferro-silico-manganese	0.3742	0.9403	0.7591	0.9260	0.7890	0.8861	0.8907	0.9295	0.9888	0.9954	1.0000	0.9993	0.80	0.90
720241	Ferro-chromium containing by weight more than 4% of carbon	-0.2678	-0.4244	0.8157	0.6658	0.9470	0.9081	0.9710	0.9976	0.9914	0.9911	0.9971	0.9998	0.80	0.70
720249	Ferro-chromium, nes	-0.7228	-0.9210	-0.4867	-0.8248	-0.5318	-0.9047	0.6249	-0.5098	0.2864	0.1517	0.8556	-0.3578	-0.50	-0.90
720250	Ferro-silico-chromium	0.1307	-0.9977	-0.9378	-0.9994	-0.6825	-0.9958			-0.0321	-0.9665			-0.90	-1.00

720260	Ferro-nickel	-0.9585		-0.9995	-0.9997	-0.9990	-0.9997	-1.0000	-1.0000	-0.4013	-0.9811	-1.0000	-1.0000	-1.00	-1.00
720270	Ferro-molybdenum	0.9602	0.9962	-0.8642	-0.3930	-0.9400	-0.8313	-0.9817	-0.8974	-0.7100	-0.1780	0.1754	0.9522	-0.90	-0.70
720280	Ferro-tungsten and ferro-silico-tungsten	-0.8276	0.9832	-0.9986	-0.8830	-0.9957	-0.8212	-0.9893	-0.6101	-0.8455	0.8798			-1.00	-0.80
720291	Ferro-titanium and ferro-silico-titanium	0.7912	0.7427	-0.7613	0.4414	-0.9886	-0.9337	-0.9604	0.3902	-0.9610	-0.8256	-0.4000	0.6807	-1.00	-0.90
720292	Ferro-vanadium	-0.9794	-0.8828	-0.8298	-0.0675	-0.7585	-0.1558	-0.3371	0.7985	-0.5671	0.0554	0.5496	0.6066	-0.80	-0.20
720293	Ferro-niobium	0.9798	-0.9788	0.7689	-0.9959	-0.5972	-0.9996	-0.9947	-1.0000	-0.8831	-0.9999	0.9119	-0.9719	-0.90	-1.00
720299	Ferro-alloys, nes	0.6660	0.9533	-0.2818	-0.3394	-0.1059	0.4941	-0.5268	-0.1265	0.5816	0.8292	0.8718	0.9006	-0.20	0.00
720310	Ferrous product obtained by direct reduction of iron ore, nes	0.7387	0.7973	0.4267	0.0358	-0.3176	0.1625	-0.8707	0.9499	0.9986	0.9661	0.2843	0.9962	-0.30	0.20
720390	Spongy ferrous products, or iron having a minimum purity by weight of 99.94%	-0.5360	0.8723	0.7995	0.9162	0.7032	0.7725	0.8183		0.2275	0.8863	0.7633		0.50	0.80
720410	Waste and scrap, cast iron	-0.4245	-0.8791	-0.4128	-0.8383	-0.6848	-0.9707	-0.4894	-0.9037	-0.7200	-0.9595	-0.8962	-0.9885	-0.60	-1.00
720421	Waste and scrap, stainless steel	-0.3497	-0.8210	-0.6469	-0.7871	-0.8800	-0.9516	-0.6438	-0.8503	-0.8649	-0.9258	-0.8408	-0.8876	-0.80	-0.90
720429	Waste and scrap, of alloy steel, other than stainless	-0.9950	-0.9964	-0.9340	-0.9248	-0.9791	-0.9802	-0.9635	-0.9668	-0.9957	-0.9900	-0.9959	-0.9974	-1.00	-1.00
720430	Waste and scrap, of tinned iron or steel	-0.9949	-0.9970	-0.9034	-0.9825	-0.9882	-0.9977	-0.9900	-0.9973	-0.9614	-0.9949	-0.9905	-0.9991	-1.00	-1.00
720441	Ferrous waste & scrap, iron or steel from the mechanical working of metal, nes	0.0881	-0.7238	0.1249	-0.9845	-0.6912	-0.9958	0.1461	-0.9768	-0.6450	-0.9957	-0.6498	-0.9778	-0.50	-1.00
720449	Ferrous waste and scrap, iron or steel, nes	-0.9806	-0.9911	-0.9812	-0.9957	-0.9926	-0.9984	-0.9478	-0.9935	-0.9962	-0.9992	-0.9839	-0.9974	-1.00	-1.00
720450	Remelting scrap ingots, of iron or steel	-0.7924	-0.0149	-0.8067	-0.0460	-0.9192	-0.5647	-0.9013	0.6574	-0.9773	-0.8016	-0.9594	-0.6712	-0.90	-0.50
720510	Granules of pig iron or spiegeleisen	-0.9257	-0.3275	-0.6678	-0.2311	-0.8112	-0.4008	-0.5912	0.2636	-0.7882	-0.3198	0.4311	0.9682	-0.80	-0.30

720521	Powders, alloy steel	-0.6589	-0.9395	-0.6866	-0.9787	-0.6292	-0.9784	0.9986	-0.2730	-0.7851	-0.9843	0.7847	-0.7608	-0.70	-1.00
720529	Powders, iron or steel, other than alloy	0.9023	0.2043	0.2151	0.1487	0.1903	-0.5742	0.6569	0.3390	-0.3587	-0.5002	0.9585	0.6802	0.10	-0.40
720610	Ingots, iron or non-alloy steel, of a purity of less than 99.94% iron	0.1658	-0.5343	0.5739	0.5573	0.0839	-0.3799	0.1243	0.8605	-0.1421	-0.6536	0.8923	0.7742	0.20	-0.30
720690	Primary forms, iron/non-alloy steel, nes, of a purity < 99.94% iron	-0.2673	-0.8681	0.7550	-0.9795	-0.1725	-0.7644	0.9463	0.6197	-0.7125	-0.9286	-0.1821	-0.7863	-0.20	-1.00
720711	Semi-finished product rectangular including square cross-section, the width measuring less than twice the thickness	0.5963	-0.0485	-0.8923	-0.5552	-0.9403	-0.7813	-0.9267	-0.6551	-0.5971	-0.0903	-0.1705	0.3072	-0.90	-0.70
720712	Semi-finished product ,iron/non-alloy steel, rectangular other than square cross-section	0.9896	-0.9967	0.2221	-0.9997	-0.4216	-0.9999	-0.7196	-1.0000	0.3526	-0.9989	0.9997	-0.7267	-0.30	-1.00
720719	Semi-finished product, iron or non-alloy steel, containing by weight <.25% carbon, nes	0.9546	0.9200	0.9561	0.9537	0.8935	0.8501	0.9962	0.9995	0.9768	0.9566	0.9984	0.9984	0.90	0.90
720720	Semi-finished product, iron/non-alloy steel, containing by weight .25%/more carbon	0.7948	-0.3329	-0.2222	-0.9143	-0.5904	-0.9393	-0.6473	-0.8909	0.4903	-0.6648	0.9951	0.9424	-0.40	-0.90
720810	Hot rolled iron/steel, coils, >600mm, relief pattern	-0.9032	0.8898	-0.1514	0.9611	0.2230	0.8776	0.2862	0.9548	-0.5473	0.8740	-0.5207	0.8455	-0.30	0.90
720825	Hot roll steel, coil, pickled >600mm wide x >4.75mm	0.7189	0.9671	0.8674	0.8192	0.7355	0.6682	0.9637	0.9645	0.8484	0.8563	0.9933	0.9993	0.80	0.70
720826	Hot roll steel, coil, pickled >600mm x 3-4.75mm	-0.6791	-0.7015	-0.3686	-0.1926	-0.4823	-0.1851	0.3089	0.6648	-0.2056	-0.0256	0.5786	0.7122	-0.40	-0.20
720827	Hot roll steel, coil, pickled >600mm wide <3mm thick	0.5238	0.6024	-0.0218	-0.5302	-0.0754	-0.5308	0.6116	0.1898	0.3599	-0.3983	0.5999	0.2430	0.00	-0.50
720836	Hot roll iron/steel nes, coil >600mm x >10mm	0.9159	0.9718	-0.5568	0.5766	0.0162	0.5522	0.8043	0.8727	0.0785	0.7522	0.4859	0.9325	-0.30	0.60
720837	Hot roll iron/steel nes, coil >600mm x 4.75-10mm	0.2771	0.6347	0.5533	0.2812	0.6486	0.0070	0.8439	0.3876	0.6121	0.2127	0.9082	0.6879	0.60	0.20
720838	Hot roll iron/steel nes, coil >600mm x 3-4.75mm	0.3238	0.7601	-0.8310	0.0382	-0.7452	-0.0064	-0.4647	0.3981	-0.5997	0.4350	-0.1733	0.7012	-0.80	0.10

720839	Hot roll iron/steel nes, coil >600mm x <3mm	0.3824	-0.1583	0.1327	-0.2123	0.2582	-0.0335	0.5675	0.3902	0.6358	0.6145	-0.3936	-0.0783	0.20	-0.10
720840	Hot roll iron/steel, not coil >600mm relief pattern	-0.9968	-0.7968	-0.9958	-0.1219	-0.9961	-0.4863	-0.9876	0.5496	-0.9958	-0.3786	-0.9924	-0.0785	-1.00	-0.40
720851	Hot roll iron/steel, not coil >600mm x >10mm	0.8126	0.7289	-0.5643	-0.2190	-0.5297	-0.3131	0.2900	0.4004	0.0146	0.2747	0.9422	0.9469	-0.50	-0.20
720852	Hot roll iron/steel, not coil >600mm x 4.75-10mm	0.4080	0.3674	-0.3797	-0.2233	-0.6342	-0.5828	-0.0470	0.0350	0.0050	-0.0554	0.0453	-0.0123	-0.50	-0.40
720853	Hot roll iron/steel, not coil >600mm x 3-4.75mm	0.3605	-0.1578	-0.1253	-0.1048	-0.7132	-0.8553	0.0434	-0.1473	0.2000	-0.4249	0.3636	-0.0593	-0.50	-0.70
720854	Hot roll iron/steel, not coil >600mm x <3mm	-0.5774	-0.1039	-0.5251	0.3956	-0.7973	0.1171	-0.5645	0.5870	-0.2386	0.6425	0.4313	0.9043	-0.70	0.30
720890	Flat rolled product, iron/non alloy steel, not further worked than hot rolled, nes	-0.4411	0.1749	-0.4164	0.4177	-0.1561	0.1910	0.7828	0.9379	0.5768	0.7592	0.8552	0.5256	-0.20	0.40
720915	Cold rolled iron/steel, coils >600mm x >3mm	0.2810	0.7294	0.5507	0.0491	0.4139	0.0209	0.8835	0.8530	0.6255	0.5661	0.8852	0.9220	0.50	0.10
720916	Cold rolled iron/steel, coils >600mm x 1-3mm	0.9414	-0.0838	0.2273	-0.6720	0.2930	-0.6035	0.5620	-0.1217	0.6381	-0.3698	0.8633	0.3222	0.30	-0.60
720917	Cold rolled iron/steel, coils >600mm x 0.5-1mm	0.5427	0.1903	-0.5499	-0.7789	-0.3736	-0.6389	0.0111	-0.1134	0.2096	-0.2903	0.7115	0.7149	-0.40	-0.70
720918	Cold rolled iron/steel, coils >600mm x <0.5mm	0.6249	0.9601	0.0933	-0.0045	0.8079	0.7627	0.6911	0.7237	0.9258	0.8793	0.9631	0.9925	0.50	0.40
720925	Cold roll iron/steel, not coil>600mm x >3mm	-0.0135	0.5266	-0.1046	-0.5261	-0.3658	-0.4304	0.9053	0.9596	0.0161	0.0693	-0.5799	-0.5438	-0.20	-0.40
720926	Cold roll iron/steel, not coil>600mm x 1-3mm	0.2865	-0.1609	-0.5658	0.1391	-0.8846	-0.6528	-0.7192	0.2577	-0.1757	0.2336	0.1772	0.5806	-0.80	-0.40
720927	Cold roll iron/steel, not coil>600mm x 0.5-1mm	-0.5971	0.0038	-0.7328	0.1828	-0.8594	-0.2431	-0.8098	0.3740	0.3727	0.6627	0.4600		-0.80	0.00
720928	Cold roll iron/steel, not coil>600mm x <0.5mm	0.7863	0.8336	0.4734	0.3302	0.4901	0.0513	0.4067	0.7380	0.7667	0.9176	0.9074		0.50	0.30
720990	Flat rolled product, iron/non alloy steel, not in coil, cold rolled >/=600mm wide, nes	-0.8280	0.3775	-0.3373	0.7662	-0.2523	0.5396	0.0862	0.9457	-0.2933	0.6252	-0.1793	0.3385	-0.30	0.60

721011	Flat rolled product, iron/non alloy steel, plated or coated with tin, width>/=600mm,>/=0.5mm thick	0.6836	-0.8806	0.7601	-0.3973	0.7648	-0.4650	0.9489	0.7656	0.7293	-0.5907	0.6587	-0.0681	0.70	-0.50
721012	Flat rolled product ,iron/non alloy steel, plated or coated with tin,>/=600mm wide,<0.5mm thick	0.7730	0.4816	-0.1862	-0.4299	-0.2915	-0.4575	0.1375	0.0510	0.2320	-0.0343	0.9923	0.9885	-0.20	-0.40
721020	Flat rolled product ,plated or coated with lead,>/=600mm wide, including terne-plate	-0.5076	-1.0000	-0.9780	-1.0000	-0.9670	-1.0000			-0.9659	-1.0000	-0.8556	-1.0000	-1.00	-1.00
721030	Flat rolled iron/non alloy steels, electrolytically zinc coated > 600mm	-0.7346	-0.7362	-0.9637	-0.9616	-0.9430	-0.9578	0.0675	-0.3516	-0.8499	-0.9302	-0.8651	-0.8153	-0.90	-1.00
721041	Flat rolled product, iron/non alloy steels, plated or coated with zinc ,corrugated,>/=600m wide, nes	0.5740	0.8032	0.9165	0.9433	0.9755	0.9932	0.6347	0.8519	0.9839	0.9968	0.9918	0.9981	0.90	0.90
721049	Flat rolled product, iron/non alloy steels, plated or coated with zinc,>/=600mm wide, nes	0.6892	0.7263	0.6245	0.2482	0.6313	0.3352	0.8890	0.7677	0.8455	0.5923	0.9582	0.9085	0.70	0.40
721050	Flat rolled product, iron/non alloy steels, plated or coated with chromium oxide/or with chromium and chromium oxides ,>/=600mm	-0.0521	-0.4251	-0.9730	-0.9534	-0.9596	-0.9360	-0.9594	-0.9457	-0.9228	-0.8959	-0.4332	-0.3611	-1.00	-0.90
721061	Flat rolled iron/non alloy steels, coated alum-zinc alloy, width > 600mm	0.7435	0.8733	0.4073	0.2221	0.8074	0.7856	0.5585	0.4649	0.9494	0.8932	0.5803	0.6206	0.60	0.50
721069	Flat rolled iron/non alloy steels, coated aluminium, width >6 00mm	-0.4298	0.8823	-0.9496	-0.4814	-0.9112	-0.2378	-0.4905	0.9466	-0.8321	-0.0931	0.6754	0.2544	-0.90	-0.30
721070	Flat rolled product, iron/non alloy steels, painted, varnished or plastics coated,>/=600mm wide	0.5771	0.4667	-0.0624	-0.3190	0.1352	0.0400	0.6728	0.7275	0.7244	0.7443	0.9984	0.9998	0.10	-0.10

721090	Flat rolled product, iron/non alloy steels, clad, plated or coated, >/=600mm wide, nes	0.8009	0.8378	0.7961	0.6960	0.8558	0.6318	0.9800	0.9724	0.9214	0.7614	0.9908	0.9834	0.80	0.70
721113	Hot rolled (4 faces) iron/non alloy steel, no coil, no relief <600	-0.0249	0.3326	0.1745	-0.9580	-0.6959	-0.9954	0.9712	-0.1896	0.2654	-0.9528	0.9802		-0.50	-1.00
721114	Hot rolled (4 faces) iron/non alloy steel, nes, <600mm x >4.75	0.8017	0.8623	-0.2544	0.2399	-0.4972	-0.3495	0.4165	0.3589	-0.1824	-0.3947	0.8400	0.1683	-0.40	-0.20
721119	Flat rolled product, iron/non alloy steels, of a width < 600 mm, simply hot-rolled, not clad, plated or coated, of a thickness < 4.75 mm “ECSC” (excl. “wide flats”)	0.2659	-0.1249	-0.4152	-0.4005	-0.9064	-0.9170	-0.4081	-0.7917	-0.8437	-0.8792	0.9943	-0.3591	-0.80	-0.90
721123	Cold roll iron/steel, <600mm, <0.25% carbon		0.9996	-0.4823	0.4492	-0.9063	-0.5345	-0.0712	0.4179	-0.6654	-0.0973	0.9993	0.9976	-0.80	-0.20
721129	Flat rolled product, iron/non alloy steels, hot rolled, <600mm wide nes	0.9841	0.9713	0.6734	0.3033	0.4354	0.0896	0.9218	0.8295	0.7474	0.4138	0.9714	0.9948	0.60	0.20
721190	Flat rolled product, iron/non alloy steels, <600mm wide, not clad, plated or coated, nes	0.3910	0.6932	0.6604	0.1558	0.0913	-0.4269	0.4684	0.3812	0.4671	-0.2411	0.8616	0.8110	0.30	-0.20
721210	Flat rolled product, iron/non alloy steels, <600mm wide, plated or coated with tin, nes	-0.7001	-0.6353	-0.1698	-0.4906	-0.3527	-0.6888	0.3864	0.2525	-0.1647	-0.6912	0.8196	-0.3768	-0.30	-0.60
721220	Flat rolled iron/non alloy steels, width <600mm, electro-plated zinc	0.7006	0.1845	-0.6569	-0.3337	-0.7229	-0.5490	-0.2896	0.0844	-0.5007	-0.1932	0.0596	0.7989	-0.70	-0.40
721230	Flat rolled product, iron/non alloy steels, <600mm wide, plated or coated with zinc	0.6378	0.8836	0.0059	0.5217	-0.6750	-0.2490	0.2219	0.7298	-0.0452	0.3711	0.1161	0.2930	-0.50	0.10
721240	Flat rolled product, iron/non alloy steels,<600mm wide, painted, varnished or plastic coated	0.8686	0.9634	0.3555	-0.0344	-0.0316	-0.3356	0.5721	0.3946	0.1771	0.0457	0.9542	0.9333	0.20	-0.10

721250	Flat rolled product, iron/non alloy steels, <600mm wide, plated or coated, nes	-0.8929	-0.7177	-0.9339	-0.7288	-0.9439	-0.7794	-0.6601	0.0591	-0.8815	-0.6542	-0.9582	-0.8088	-0.90	-0.70
721260	Flat rolled product, iron/non alloy steels, <600mm wide, clad	0.8051	0.0130	-0.2709	-0.7855	-0.7559	-0.8380	0.7683	0.6112	-0.3743	-0.8580	-0.1000	-0.8120	-0.60	-0.80
721310	Bars & rods, iron/non alloy steels, hot-rolled, in irregularly wound coils of iron or non-alloy steel, with indentations, ribs, grooves or other deformations produced during the rolling process “ECSC”	-0.1807	-0.9546	0.2719	-0.5790	-0.2708	-0.8583	0.6381	-0.6980	0.5072	-0.1880	-0.1573	-0.8023	0.00	-0.80
721320	Bars & rods, iron/non alloy steels, hot rolled, in irregular wound coils, of free cutting steel	-0.1777	0.0231	-0.0277	0.1086	-0.7620	-0.6155	0.2248	0.1320	-0.1720	-0.0854	0.9709	0.9450	-0.60	-0.40
721391	Hot rolled bar/rod, irregular coils, <14mm diameter	0.0056	-0.4559	-0.5363	-0.4885	-0.7328	-0.7786	-0.6458	-0.6809	-0.1883	-0.1726	0.0168	0.8313	-0.60	-0.70
721399	Hot rolled bar/rod, irregular coils, nes	-0.6409	-0.8825	-0.9257	-0.9223	-0.9373	-0.9530	-0.9779	-0.4537	-0.8529	-0.9009	0.0861	-0.1054	-0.90	-0.90
721410	Bars & rods, iron or non-alloy steel forged	-0.3314	0.6112	-0.4081	0.5829	0.0064	0.4019	0.4527	0.2232	0.2657	0.6498	0.9209	0.9743	-0.20	0.50
721420	Bars & rods, iron/non alloy steels, with indentations, ribs, groves or other deformations produced during the rolling process “ECSC”	-0.8852	-0.8701	-0.9789	-0.9415	-0.9698	-0.9523	-0.9659	-0.9313	-0.7909	-0.7549	-0.7161	-0.6113	-1.00	-0.90
721430	Bars & rods, iron/non alloy steels, hot rolled drawn or extruded of free cutting steel, nes	-0.7218	0.3273	-0.9195	-0.8435	-0.9410	-0.8838	-0.7880	-0.7536	-0.9696	-0.7951	0.8638	-0.0679	-0.90	-0.80
721491	Bar/rod, rectangular (not square) nes	-0.3283	0.3778	-0.2448	0.2304	-0.8490	-0.6109	-0.5235	-0.4655	-0.5077	-0.2684	0.7806	0.9668	-0.70	-0.40
721499	Bars & rods, iron/non alloy steel, forged etc., nes	-0.0728	-0.1183	-0.2355	-0.1840	-0.6155	-0.5707	-0.0203	0.0149	-0.2237	-0.1738	0.7533	0.8210	-0.50	-0.40

721510	Bars & rods, iron/non alloy steels, not further worked than cold formed or finished of free cutting steel	-0.9891	0.1239	-0.9078	-0.5776	-0.9899	-0.9313	-0.9280	-0.6129	-0.9785	-0.9023	-0.4194	0.8374	-1.00	-0.90
721550	Bar/rod, cold formed/finished, nes	0.6431	0.5789	0.6600	0.6268	-0.2992	-0.2363	0.8286	0.7490	0.3687	0.3622	0.9407	0.8696	0.00	0.10
721590	Bars & rods, iron/non alloy steels, nes	-0.3144	-0.1194	0.2947	0.4332	-0.0549	0.0946	0.6618	0.5951	0.3193	0.4448	0.2829	0.0127	0.10	0.20
721610	Sections ,U,I/H, iron/non alloy steels, not further worked than hot rolled/drawn/extruded, height <80mm	0.1152	-0.5950	-0.0299	-0.3487	0.0391	-0.6240	0.1734	-0.4505	-0.0803	-0.4714	-0.6831	-0.8527	0.00	-0.50
721621	Sections, L, iron/non alloy steels, not further worked than hot rolled, drawn or extruded, of a height <80mm	-0.9087	-0.7652	-0.9655	-0.9534	-0.9356	-0.9451	-0.9651	-0.9756	-0.9135	-0.9492	0.6031	0.7239	-0.90	-0.90
721622	Sections ,T, iron/non alloy steels, not further worked than hot rolled, drawn or extruded, of a height <80mm	-0.2759	0.5334	-0.4576	0.2689	-0.7198	-0.6324	-0.6725	0.0955	-0.0998	0.7411	0.7501	0.9821	-0.60	-0.40
721631	Sections ,U, iron/non alloy steels, not further worked than hot rolled, drawn or extruded, height 80mm or more	-0.2255	-0.4156	-0.8181	-0.4476	-0.8741	-0.8066	-0.4033	-0.2336	-0.5057	-0.3336	0.6909	0.5811	-0.80	-0.70
721632	Sections ,I, iron/non alloy steels ,not further worked than hot rolled, drawn or extruded, height 80mm or more	0.4022	-0.0808	-0.4398	0.1628	-0.8066	-0.6207	-0.3225	0.2591	-0.4004	-0.4045	0.9718	0.9383	-0.70	-0.40
721633	Sections ,H, iron/non alloy steels, not further worked than hot rolled, drawn or extruded, height 80mm or more	-0.4291	-0.2768	-0.8240	-0.8268	-0.7979	-0.8414	0.5701	0.4035	-0.6715	-0.7734	0.9901	0.8181	-0.80	-0.80
721640	Sections ,L or T,iron/non alloy steels, not further worked than hot rolled, drawn or extruded, h eight>/=80mm	-0.8743	-0.8373	-0.9898	-0.9623	-0.9824	-0.9586	-0.9523	-0.8277	-0.9586	-0.9126	0.9292	-0.5456	-1.00	-1.00

721650	Angles, shapes &sections ,iron/non alloy steels, not further worked than hot rolled/drawn/extruded, height>/=80mm	-0.1168	-0.3240	-0.3449	-0.6144	-0.5870	-0.6768	-0.0973	-0.1427	0.1939	-0.0341	0.4421	0.8598	-0.40	-0.60
721661	Angles, shapes etc., iron/non alloy steels, cold formed from flat	-0.9827	-0.9881	-0.9338	-0.9697	-0.9968	-0.9986	-0.9909	-0.9975	-0.8907	-0.9057	-0.8274	-0.8244	-1.00	-1.00
721669	Angles, shapes and sections, cold formed, nes	0.7218	-0.7166	0.9062	-0.1716	0.7415	-0.6962	0.9181	0.5900	0.7752	-0.6733	0.6652	-0.5424	0.80	-0.60
721691	Angles, shapes etc., iron/non alloy steels, cold formed from flat	-0.6532	-0.9654	-0.6260	-0.9737	-0.9610	-0.9957	-0.6556	-0.6876	-0.6591	-0.9783	-0.3148	-0.5135	-0.90	-1.00
721699	Angles, shapes and sections, cold formed, nes	-0.7911	0.2277	0.2484	0.1892	-0.2610	0.2170	0.8721	0.9288	0.3533	0.6937	0.1824	0.7325	-0.10	0.30
721710	Wire of iron or non-alloy steel, not plated/coated	-0.6491	-0.4722	-0.6785	-0.7273	-0.8317	-0.8541	-0.6436	-0.7562	-0.5722	-0.6085	0.7636	0.4529	-0.80	-0.80
721720	Wire of iron or non-alloy steel, zinc plated/coated	-0.2009	-0.3539	-0.2359	-0.6717	-0.1742	-0.6006	-0.1509	-0.4956	0.0781	-0.1787	0.3271	0.1301	-0.20	-0.60
721730	Wire of iron or non-alloy steel, metal coat (not zinc)	-0.5255	-0.2220	-0.8271	-0.6968	-0.8416	-0.5960	-0.6154	-0.0265	-0.6192	-0.1838	0.8667	0.9574	-0.80	-0.60
721790	Wire of iron or non-alloy steel, nes	-0.0734	-0.0964	-0.0488	-0.0144	0.0960	0.0531	0.4010	0.3180	-0.1195	0.0502	-0.0952	0.0766	0.00	0.00
721810	Ingots and other primary forms, stainless steel	-0.8545	-0.0158	0.1327	-0.3470	-0.8317	-0.8970	0.8691	-0.1758	-0.7182	-0.8852	0.8853	-0.0151	-0.70	-0.80
721891	Semi-finished stainless steel bar, rectangular	-0.9684	-1.0000	-0.9708	-1.0000	-0.9982	-1.0000	0.2129	-1.0000	-0.9684	-1.0000	0.1283	-1.0000	-1.00	-1.00
721899	Semi-finished stainless steel productnes	0.9668	0.9704	0.6630	0.5835	-0.1779	-0.3536	0.9215	0.9093	0.5173	0.1756	0.9634	0.8728	0.10	0.00
721911	Flat rolled product, stainless steel, hot rolled, in coil, width>/=600mm,thick> 10mm	0.1712	-0.2457	0.2989	-0.3176	-0.0739	-0.5511	0.9999		0.6774	-0.0448	0.8518	0.8417	0.10	-0.40
721912	Flat rolled product, stainless steel, hot rolled, in coil, width>/=600mm,4.75</=thick<10mm	-0.9942	-0.4343	-0.9868	-0.1787	-0.9929	-0.3101	-0.8972	0.9694	-0.9337	0.7539	0.6160	0.9935	-1.00	-0.20
721913	Flat rolled product, stainless steel, hot rolled in coil, width>/=600mm,3</=thick<4.75mm	-0.9205	0.0139	-0.9113	-0.1599	-0.8903	0.0261	-0.0375	0.9910	-0.1267	0.9553	0.8093	0.9997	-0.90	0.00

721914	Flat rolled product, stainless steel, hot rolled in coil, width>/=600mm,thick< 3mm	-0.9869	0.9427	-0.9989	0.6624	-0.9997	0.6093	-0.9869	0.9943	-0.9906	0.9571	-0.9163	0.9985	-1.00	0.70
721921	Flat rolled product, stainless steel, hot rolled, not in coils,>/=600mm wide, over 10mm thick	-0.9401	-0.1036	-0.8642	0.2575	-0.9250	-0.2070	-0.1700	0.5601	-0.7029	0.5692	0.5838	0.9895	-0.90	0.00
721922	Flat rolled product, stainless steel, hot rolled, not in coils, width>/=600mm,4.75mm</=thick</=10mm	-0.8829	-0.3407	-0.7078	0.1522	-0.8965	-0.4115	-0.2816	0.6541	-0.4983	0.2302	0.8077	0.9638	-0.80	-0.20
721923	Flat rolled product, stainless steel, hot rolled, not in coils ,width>/=600mm,3mm</=thick <4.75mm	-0.9988	-0.3609	-0.9957	0.2395	-0.9986	-0.2704	-0.9883	0.8651	-0.9935	0.6331	-0.9006	0.9927	-1.00	0.00
721924	Flat rolled product, stainless steel, hot rolled, not in coils ,>600mm wide, less than 3mm thick	0.7239	0.5099	0.2018	-0.0990	-0.0134	-0.2708	0.9556	0.6232	0.0010	-0.3312			0.10	-0.20
721931	Flat rolled product, stainless steel, cold rolled,>600mm wide,4.75mm or more thick	-0.9712	-0.6061	-0.8945	-0.2344	-0.9820	-0.8515	0.5181	0.8003	-0.8652	-0.2125	0.6182	0.9646	-1.00	-0.70
721932	Flat rolled product, stainless steel, cold rolled, width>/=600mm,3mm</=thick <4.75mm	-0.9465	-0.2572	-0.7740	-0.0187	-0.9379	-0.5753	-0.5674	0.4831	-0.5332	0.2548	0.5812	0.7261	-0.90	-0.30
721933	Flat rolled product, stainless steel, cold rolled, 600mm wide, 1mm <thick <3mm	-0.8530	-0.0993	-0.8103	-0.1656	-0.8792	-0.3628	-0.6278	0.3738	-0.5252	0.3146	0.9309	0.9951	-0.80	-0.20
721934	Flat rolled product, stainless steel, cold rolled, width>/=600mm,0.5mm</=thick <1mm	0.4155	-0.3061	0.1619	-0.5330	0.0998	-0.5173	0.3718	-0.2558	0.8129	0.3402	0.9725	0.9801	0.20	-0.50
721935	Flat rolled product, stainless steel, cold rolled,>600mm wide, less than 0.5mm thick	-0.8743	-0.8831	-0.9880	-0.9617	-0.9764	-0.9218	-0.9557	-0.8710	-0.9740	-0.8473		0.3578	-1.00	-0.90

721990	Flat rolled product, stainless steel, 600mm or more wide, nes	0.8226	0.9530	0.0294	0.6265	-0.3759	0.4723	0.9713	0.9747	-0.0024	0.1504	0.6786	0.9859	-0.20	0.50
722011	Flat rolled product ,stainless steel, hot rolled <600mm wide, exceeding 4.75mm thick	0.9501	0.9359	0.5700	0.9441	0.0253	0.8322	0.9590	0.9961	-0.2808	0.9069	0.9837	0.9995	0.20	0.90
722012	Flat rolled product, stainless steel, hot rolled <600mm wide, less than 4.75mm thick	-0.6330	0.6811	-0.9014	-0.7682	-0.8991	-0.4610	0.5481	0.4525	-0.8011	-0.4386	-0.3985	0.0759	-0.90	-0.60
722020	Flat rolled product, stainless steel, <600mm wide, cold rolled or reduced	0.5052	0.7205	-0.6452	0.0552	-0.7803	-0.2876	-0.2791	0.5881	-0.5595	0.2243	0.9303	0.9972	-0.70	-0.10
722090	Flat rolled product, stainless steel, cold rolled <600mm wide, nes	0.8097	0.8412	0.2418	0.0642	0.3817	0.4228	0.9773	0.9746	0.3917	0.0247	0.6196	0.9559	0.40	0.20
722100	Bars & rods, stainless steel, hot rolled in irregularly wound coils	0.9919	0.9915	0.5073	0.3502	0.5621	0.4170	0.9961	0.9747	0.9217	0.9045	0.9938	0.9910	0.60	0.50
722211	Hot rolled/extruded stainless steel bars, circular	0.9975	0.9971	0.8888	0.7112	0.4811	0.1785	0.9843	0.8609	0.8593	0.5154	0.9582	0.9829	0.70	0.40
722219	Hot rolled/extruded stainless steel bars, nes	0.4298	0.6674	0.1868	0.1622	-0.5281	-0.6023	0.5292	0.7825	0.0723	-0.1623	0.9088	0.8422	-0.30	-0.30
722220	Bars & rods, stainless steel, not further worked than cold formed or cold finished	0.9998	0.9926	0.9115	0.8709	0.7222	0.6023	0.9472	0.9461	0.9379	0.8838	0.9991	0.9978	0.80	0.70
722230	Bars & rods, stainless steel, nes	0.7908	0.8388	0.3575	0.6349	-0.2556	0.0632	0.9481	0.9667	0.1757	0.4339	0.7953	0.8487	0.00	0.30
722240	Angles, shapes and sections, stainless steel	0.9876	0.9877	0.9374	0.9033	0.8888	0.7719	0.9979	0.9916	0.9683	0.9158	0.9890	0.9807	0.90	0.80
722300	Wire of stainless steel	0.9552	0.9966	0.7734	0.7406	0.7910	0.7794	0.9589	0.9423	0.9092	0.8533	0.9859	0.9894	0.80	0.80
722410	Ingots & other primary forms of alloy steel, other than stainless	0.9915	0.6750	0.9757	0.0481	0.6983	-0.7721	0.9734	0.9633	0.8733	-0.7389	0.9951	0.6133	0.80	-0.60
722490	Semi-finished product of alloy steel other than stainless	0.9749	0.9957	0.8717	0.6821	0.4926	0.0020	0.3770	-0.5283	0.7196	0.5019	0.9338	0.9858	0.60	0.20
722511	Flat-rolled alloy steel, >600mm, grain oriented		0.9565	-0.7567	-0.8582	-0.7803	-0.8091	-0.1435	0.0362	-0.8217	-0.7547	0.9559		-0.80	-0.80
722519	Flat-rolled alloy steel, >600mm, nes	0.9707	0.9766	-0.7276	-0.7979	-0.5786	-0.5848	0.7342	0.8820	0.1761	-0.0916	0.9839	0.9995	-0.60	-0.70

722520	Flat rolled products of high speed steel >/=600mm wide													1.00	
722530	Flat rolled product, alloy steel, other than stainless, in coils, not further worked than hot rolled, width>/=600mm,nes	0.9979	0.9964	-0.8833	-0.5132	-0.8024	-0.1483	-0.4585	0.4881	-0.5215	0.5803	0.9689	0.9889	-0.80	-0.30
722540	Flat rolled product, alloy steel, other than stainless, not in coils not further worked than hot rolled,>/=600mm wide, nes	0.8947	0.2054	-0.9746	-0.9739	-0.9904	-0.9749	-0.8452	-0.3169	-0.9685	-0.9300	-0.9481	-0.6626	-1.00	-1.00
722550	Flat rolled product, alloy steel, other than stainless, not further worked than cold rolled,>/=600mm wide, nes	0.4779	0.9513	-0.9993	-0.9954	-0.9994	-0.9930	-0.9976	-0.9895	-0.9989	-0.9918	-0.9207	0.2765	-1.00	-1.00
722591	Flat rolled alloy-steel, >600mm, zinc electro-plated	-1.0000		-1.0000	-0.9979	-1.0000	-0.9974	-1.0000	-0.9870	-1.0000	-0.9962	-1.0000	0.7420	-1.00	-1.00
722592	Flat rolled alloy-steel, >600mm, zinc coated nes	-1.0000	0.8476	-1.0000	-0.9607	-1.0000	-0.9853	-1.0000	-0.9263	-1.0000	-0.9820	-1.0000		-1.00	-1.00
722599	Flat rolled alloy-steel, >600mm, nes	-0.0060	0.0466	-0.8128	-0.8547	-0.9422	-0.9362	-0.1251	-0.1995	-0.8600	-0.8273	-0.6544	-0.2243	-0.90	-0.90
722611	Flat-rolled silicon-electrical steel, grain oriented	0.9966	0.9480	0.0312	-0.3427	-0.4085	-0.5784	0.3246	-0.3966	0.0067	-0.4464	0.8400	0.9934	-0.20	-0.50
722619	Flat-rolled silicon-electrical steel, nes <600mm	-0.1620	0.9097	-0.7682	0.0023	-0.9402	-0.6638	-0.7080	0.3635	-0.7103	-0.0466	-0.1520	0.8528	-0.90	-0.40
722620	Flat rolled product, of high speed steel, <600mm wide		0.9980	0.7089	0.9699	0.3647	0.9155	0.8200	0.9831	0.7650	0.9666	0.9882		0.50	0.90
722691	Flat rolled product, alloy steel ,other than stainless, not further worked than hot rolled,<600mm wide, nes	-0.3615	0.8171	-0.9885	-0.9625	-0.9961	-0.9855	-0.8230	-0.8409	-0.9857	-0.9618	-0.8459	-0.4628	-1.00	-1.00
722699	Flat rolled product, as, o/t stainless, <600mm wide, nes	0.8676	0.8421	-0.0229	0.0823	-0.1799	0.0210	0.3970	0.8639	-0.2433	-0.2976	-0.2568	0.0638	-0.10	0.00
722710	Bars & rods, of high speed steel, hot rolled, in irregularly wound coils	0.9992	0.1317	0.6556	0.4499	-0.2430	-0.7578		0.0426	0.6385	-0.1092	0.9503	0.7173	0.10	-0.50

722720	Bars & rods, of silico-manganese steel, hot rolled, in irregularly wound coils			-0.9613	-0.9632	-0.9577	-0.9568	-0.4505	-0.6654	-0.9581	-0.9721			-1.00	-1.00
722790	Bars & rods, alloy steel, other than stainless hot rolled, in irregularly wound coils, nes	0.9945	0.9062	-0.7337	-0.9707	-0.3690	-0.9084	-0.3225	-0.7028	0.3048	-0.7508	0.9769	0.6594	-0.50	-0.90
722810	Bars and rods of high speed steel, nes	0.9144	0.5761	0.0160	-0.0431	-0.3114	-0.4329	0.7643	0.5606	0.4709	0.4310	0.2284	0.4794	-0.10	-0.20
722820	Bars and rods of silico-manganese steel nes	0.9892	0.6210	-0.7855	0.1565	-0.7099	-0.7689	0.3030	0.9147	0.3164	-0.0207			-0.70	-0.60
722830	Bars & rods, alloy steel, other than stainless not further worked than hot rolled/drawn/ extruded, nes	0.1534	0.3349	-0.7690	-0.6455	-0.6130	-0.4307	-0.2664	-0.0408	-0.4255	-0.4213	-0.1271	0.5004	-0.70	-0.50
722840	Bars & rods, alloy steel, other than stainless, not further worked than forged	0.9374	0.8168	-0.8942	-0.8610	-0.9331	-0.8993	-0.3719	0.0888	-0.8291	-0.5068	-0.1163	0.9478	-0.90	-0.90
722850	Bars & rods, alloy steel, other than stainless, not further worked than cold formed/ finished	0.9982		-0.7442	-0.8372	-0.9559	-0.9618	-0.8693	-0.8757	-0.9007	-0.9327	0.6461	0.8228	-0.90	-0.90
722860	Bars & rods, alloy steel, other than stainless, nes	-0.3225	0.0187	0.3385	0.4710	0.4732	0.3681	0.9497	0.9659	0.3504	0.3644	0.7464	0.8072	0.40	0.40
722870	Angles, shapes and sections, alloy steel, other than stainless, nes	-0.9338	-0.9936	-0.9774	-0.9997	-0.9830	-0.9983	-0.4865	-0.9814	-0.9723	-0.9984	-0.8721	-0.9914	-1.00	-1.00
722880	Bars & rods, hollow drill, alloy or non-alloy steel	0.0555	-0.3328	0.8370	0.3186	0.4031	-0.2476	0.7081	0.0911	0.4884	-0.0416	-0.4421	-0.5610	0.50	-0.10
722910	Wire of high speed steel	0.8347		0.9894										1.00	
722920	Wire of silico-manganese steel	0.9747	-0.8003	-0.4568	-0.9998	-0.0840	-0.9995	-0.0421	-0.9994	0.6879	-0.9991	0.9323	-0.9827	-0.20	-1.00
722990	Wire of alloy steel, other than stainless	0.4628	0.5236	-0.7470	-0.7308	-0.6296	-0.5989	0.1124	0.0957	-0.4097	-0.1731	-0.3897	0.1073	-0.60	-0.60

730110	Sheet piling, iron/steel whether/ not drilled/punched/made from assembled elements	-0.1235	-0.7029	-0.8365	-0.9662	-0.9261	-0.9806	0.7024	0.1609	-0.7157	-0.8850	-0.3221	-0.8898	-0.90	-1.00
730120	Angles, shapes and sections, welded, iron or steel	-0.5471	-0.0016	0.4271	-0.1576	0.4113	-0.2841	0.9072	0.2755	0.0979	-0.5284	0.6310	-0.3794	0.30	-0.30
730210	Rails, iron or steel	0.2716	0.8123	-0.7438	-0.4139	-0.8476	-0.5679	0.6019	0.9558	-0.7035	-0.3049	0.5425	0.8440	-0.80	-0.40
730230	Switch blades, crossing frogs, point rods & other crossing pieces, iron or steel	0.7708	0.9045	0.1191	0.4668	-0.7996	-0.1316	0.7556	0.9705	-0.5612	0.1570	0.9550	0.9896	-0.60	0.10
730240	Fish plates and sole plates, iron or steel	0.7926	0.5036	-0.3347	-0.6518	-0.7343	-0.8596	0.2964	-0.5787	-0.8587	-0.8828	-0.1172	0.2456	-0.70	-0.80
730290	Rail or tramway construction material of iron or steel, nes	0.2680	0.1926	0.4405	0.5811	-0.1769	0.1243	0.6502	0.7173	-0.3753	0.1257	-0.6825	-0.5772	-0.10	0.20
730300	Tubes, pipes and hollow profiles of cast iron	0.9526	0.9830	0.5276	0.6870	0.7512	0.8757	0.8516	0.9832	0.7945	0.9255	0.8010	0.9149	0.70	0.80
730410	Pipes, line, iron or steel, seam-less, of a kind used for oil or gas pipelines	0.4399	0.3469	0.0727	-0.2032	0.2120	0.0938	0.1134	0.1731	0.5569	0.3850	0.8325	0.8431	0.20	0.00
730421	Drill pipe (iron or steel)	0.8644	0.8574	0.4520	0.5822	0.7259	0.7236	0.8544	0.7515	0.3213	0.3438	0.8137	0.8679	0.60	0.60
730429	Casings, tubing, drill pipe, for oil drilling use	0.7487	0.7579	-0.2968	-0.5244	0.1460	-0.2207	-0.4722	-0.7268	0.2882	-0.2041	0.9556	0.7105	-0.10	-0.40
730431	Tubes, pipe & hollow profiles, iron/non alloy steels, seamless ,cold drawn or cold rolled cold reduced, of circular cross section, nes	0.9545	0.9300	-0.3207	-0.0548	-0.6653	-0.5364	0.2836	0.3939	0.0176	0.1121	0.5698	0.6964	-0.50	-0.30
730439	Tubes, pipe & hollow profiles, iron or non alloy steel, seam-less, of circ cross section, nes	0.7842	0.8003	0.0110	-0.2566	-0.5385	-0.6684	0.4884	0.2098	0.1695	0.0014	0.3782	0.8798	-0.30	-0.50
730441	Tube, pipe & hollow profile, stainless steel, seamless ,cold drawn or cold rolled cold reduced, of circular cross section, nes	0.9566	0.9800	-0.3759	-0.3037	-0.3477	-0.2225	0.9418	0.9514	0.0153	0.0964	0.8986	0.8839	-0.30	-0.20

730449	Tubes, pipe & hollow profiles, stainless steel, seamless, of circular cross section, nes	0.7565	0.0748	0.1921	-0.6799	-0.5027	-0.9082	0.7700	0.1001	0.1204	-0.7424	0.6259	0.0065	-0.30	-0.80
730451	Tubes, pipe & hollow profile, alloy steel,(other than stainless) seamless ,cold drawn or cold rolled cold reduced of circular cross section	0.9923	0.8559	0.0462	-0.2944	0.0138	-0.2917	0.4112	-0.1244	0.3320	-0.2430	0.5289	0.4833	0.10	-0.30
730459	Tubes, pipe & hollow profile, alloy steel,(other than stainless) seamless ,cold drawn or cold rolled cold reduced of circular cross section, nes	0.9433	0.9616	0.1662	0.3323	-0.3415	-0.0393	-0.0442	-0.0033	0.0701	0.1298	0.8908	0.9038	-0.10	0.10
730490	Tubes, pipe & hollow profiles, iron or steel, seamless, nes	0.8361	0.8680	0.5961	0.7563	0.5893	0.6094	0.9159	0.8555	0.1784	0.8472	0.7936	0.8225	0.50	0.70
730511	Line pipe of a kind used for oil or gas pipelines, Longitudinally submerged arc welded	0.9997	0.9960	0.8936	0.7796	0.8982	0.8204	0.9197	0.9597	0.9326	0.9652	1.0000	1.0000	0.90	0.80
730512	Other Line pipe of a kind used for oil or gas pipelines, longitu-dinally welded	-0.0299	0.2654	-0.7378	-0.9693	-0.4178	-0.9343	-0.5309	-0.6569	-0.3079	-0.9289	0.9041	0.9091	-0.60	-0.90
730519	Other Line Pipe, Welded, More than 406.4mm in External Diameter	0.9370	0.9929	-0.4445	0.4125	0.1083	0.8185	0.9962	0.9974	0.1998	0.2320	0.8506	0.9759	-0.10	0.60
730520	Casing of a kind used in drilling for oil or gas	0.3236	-0.8245	-0.1714	-0.9325	0.2035	-0.9201	0.3781	-0.8740	-0.1771	-0.9332	0.2600	-0.9006	0.00	-0.90
730531	Other Tubes and Pipes, Longi-tudinally welded	0.8254	-0.7072	0.5575	-0.9854	0.1394	-0.9945	0.9356	-0.8585	0.7327	-0.9837	0.8912	-0.8981	0.40	-1.00
730539	Other Tubes and Pipes, Welded, of Iron or Steel	-0.1974	0.7523	-0.9720	-0.3017	-0.9655	-0.5008	-0.7011	0.4840	-0.9697	-0.6181	-0.9027	0.7137	-1.00	-0.40
730590	Other Tubes and Pipes, Riveted or Similarly Closed, of Iron or Steel	0.6280	0.6046	0.4360	0.4413	0.5600	0.4595	0.9851	0.8288	0.7191	0.7235	0.8643	0.9157	0.50	0.50

730610	Line pipe of a kind used for oil or gas pipelines, of iron or steel, of an external diameter of <= 406.4 mm (excl. of cast iron and seamless tubes)	0.9564	0.8996	0.1591	0.1727	0.5340	0.6212	0.2737	0.5423	0.6029	0.6567	0.9435	0.9765	0.40	0.40
730620	Casing and tubing of a kind used in drilling for oil or gas of Iron or Steel, Open Seam or Welded, Riveted	0.2398	0.0672	-0.9277	-0.9097	-0.4245	-0.1913	-0.9276	-0.8552	-0.9275	-0.9438	0.7476	0.0786	-0.90	-0.90
730630	Other Tubes, Pipes, Hollow Profiles, welded, of circular cross section, of iron or nonalloy steel	0.3480	0.5652	-0.1266	-0.0776	-0.3890	-0.2704	-0.0788	0.1106	-0.3194	-0.2037	0.5541	0.8855	-0.30	-0.20
730640	Other Tubes, Pipes, Hollow Profiles, welded, of circular cross section, of stainless steel	0.9439	0.8064	0.0952	-0.4714	-0.2770	-0.6506	0.6103	-0.2081	0.2659	-0.3466	0.9177	0.8445	-0.10	-0.50
730650	Other Tubes, Pipes, Hollow Profiles, welded, of circular cross section, of other alloy steel	-0.7704	-0.9605	-0.8096	-0.9831	-0.7316	-0.9594	-0.5448	-0.8954	-0.9196	-0.9885	-0.5835	-0.9632	-0.80	-1.00
730660	Other Tubes, Pipes, Hollow Profiles, welded, of non-circular cross section	-0.5164	-0.8389	-0.8979	-0.9552	-0.9629	-0.9792	-0.8968	-0.9498	-0.9258	-0.9559	-0.8692	-0.8812	-0.90	-1.00
730690	Other Tubes, Pipes, Hollow Profiles, of Iron or Steel, Open Seam, Riveted	0.3627	0.3579	0.6252	0.5667	0.6861	0.6716	0.8593	0.8784	0.7802	0.6707	0.8259	0.8900	0.70	0.60
730711	Fittings, pipe or tube, of non-malleable cast iron	0.9351	0.8440	0.4461	0.2050	0.4167	0.3402	0.6493	0.6390	0.6364	0.6752	0.8770	0.9095	0.50	0.30
730719	Fittings, pipe or tube, cast, of iron or steel, nes	0.6570	0.5659	-0.2631	-0.5915	-0.2811	-0.5215	-0.1278	-0.2772	-0.2807	-0.4888	0.7320	0.6927	-0.20	-0.50
730721	Flanges, stainless steel	0.9677	0.9247	0.7983	0.6593	0.7577	0.6914	0.9752	0.9553	0.9211	0.8779	0.9702	0.9665	0.80	0.70
730722	Threaded elbows, bends and sleeves of stainless steel	0.5442	0.5923	-0.3123	-0.0610	-0.5099	-0.1641	0.2616	0.5894	-0.7885	-0.6254	0.4933	0.5049	-0.50	-0.20
730723	Fittings, butt welding, stainless steel	0.6335	0.7843	-0.3942	-0.6955	-0.6954	-0.7869	0.0518	-0.0966	-0.4245	-0.5710	0.2457	0.2900	-0.60	-0.70
730729	Fittings pipe or tube of stainless steel, nes	0.7496	0.5662	0.2371	-0.0603	-0.0030	-0.1556	0.6488	0.7023	0.0379	-0.1421	0.6313	0.5763	0.10	-0.10

730791	Flanges, iron or steel, nes	0.9385	0.9291	0.3015	0.5985	0.4338	0.6433	0.9422	0.9720	0.7117	0.7993	0.8691	0.9667	0.40	0.70
730792	Threaded elbows, bend and sleeves, iron or steel, nes	0.8192	0.6540	0.2155	-0.2340	0.1854	-0.0065	0.2568	-0.0964	-0.2742	-0.5125	0.6980	0.4951	0.10	-0.20
730793	Fittings, but welding, iron or steel, nes	0.9282	0.7794	-0.6374	-0.6929	-0.6524	-0.6438	0.0439	-0.0738	-0.3093	-0.4603	0.9304	0.9243	-0.60	-0.60
730799	Fittings, pipe or tube, iron or steel, nes	0.1911	0.4092	-0.3267	-0.1266	-0.4929	-0.1610	0.1391	0.5522	-0.2920	-0.1313	0.1506	0.4263	-0.40	-0.10
730810	Bridges and bridge sections, iron or steel	-0.3622	0.2100	-0.6503	-0.3524	-0.6442	-0.6080	0.4433	0.5047	-0.4455	-0.4120	-0.1466	-0.0121	-0.60	-0.50
730820	Towers and lattice masts, iron or steel	0.4014	0.6012	0.7530	0.6807	0.7093	0.5508	0.7504	0.5927	0.8075	0.7324	0.9775	0.9577	0.70	0.60
730830	Doors, windows & their frames & thresholds for doors of iron or steel	-0.3604	-0.2353	-0.7444	-0.7308	-0.8021	-0.7827	-0.6477	-0.3225	-0.7490	-0.7306	-0.2913	-0.0385	-0.80	-0.70
730840	Props & similar equipment for scaffolding, shuttering/pit-propping, iron/steel	0.3738	0.1444	0.4282	0.2867	0.0709	0.0276	0.8764	0.8538	0.7979	0.7546	0.8972	0.7636	0.30	0.20
730890	Structures & parts of structures, iron/steel (ex prefabricated buildings of heading no.9406)	0.3138	0.2326	-0.0743	-0.2627	-0.1743	-0.2388	0.3957	0.2168	0.2588	0.1682	0.7108	0.4115	-0.10	-0.20
730900	Reservoirs, tanks, vats & similar container, capacity >300L,iron or steel(excluding liquid/com-pressed gas type)	0.1848	-0.2929	-0.3063	-0.4777	-0.5133	-0.6128	-0.0013	-0.3258	-0.3767	-0.5588	0.0609	-0.1705	-0.40	-0.50
731010	Tanks, casks, drums, cans, boxes & similar container, iron or steel, capacity >/=50L but <300L	-0.2588	-0.0911	-0.1510	-0.1896	-0.6890	-0.6102	-0.5312	-0.5382	-0.6638	-0.6273	-0.3226	-0.2823	-0.60	-0.50
731021	Cans, iron or steel, capacity <50 litres, to be closed by crimping o soldering, nes	-0.5445	-0.4547	-0.4399	-0.2020	-0.8818	-0.7637	-0.5868	-0.2861	-0.6254	-0.1891	-0.5332	-0.0030	-0.80	-0.60
731029	Cans, iron or steel, capacity <50 litres nes	-0.4583	-0.0072	-0.2878	-0.3983	-0.4479	-0.2757	-0.1270	-0.0270	-0.0983	-0.2110	-0.3475	0.2794	-0.40	-0.30
731100	Containers for compressed or liquefied gas of iron or steel	0.7341	0.8086	0.2926	0.4044	0.1578	0.3453	0.1145	0.4849	0.3335	0.4650	0.6414	0.7238	0.20	0.40

731210	Stranded wire, ropes & cables of iron or steel, not electrically insulated	0.4963	0.3513	0.0034	-0.2143	0.1423	-0.0811	0.4880	0.3102	0.4747	0.1875	0.7950	0.6299	0.10	-0.10
731290	Plaited bands, slings and the like of iron or steel, not electrically insulated	0.0261	0.3122	-0.4726	-0.1893	-0.3183	0.2396	0.5590	0.8204	0.1506	0.4463	0.3814	0.4547	-0.30	0.10
731300	Wire, barbed, twisted hoop, single flat of twisted double of iron or steel, for fencing	-0.8409	-0.7073	-0.4605	-0.4940	-0.4179	-0.2514	-0.8619	-0.7733	-0.3943	0.0424	-0.2587	-0.3090	-0.50	-0.40
731412	Endless bands for machinery, woven stainless steel	-0.8217	0.6023	-0.7382	0.6451	-0.9498	-0.2222	-0.8869	0.7920	-0.9386	-0.1157	-0.9301	-0.3880	-0.90	0.00
731414	Woven product, stainless steel, except endless bands	0.6772	0.2523	-0.3879	-0.7110	-0.4717	-0.5989	0.0936	0.1575	-0.3014	-0.4974	0.7443	0.6345	-0.40	-0.60
731419	Woven product, iron or steel, other than stainless	0.4090	0.3921	-0.1225	0.3520	-0.2258	0.0790	0.4497	0.2322	-0.1689	0.0481	0.6160	0.7010	-0.10	0.20
731420	Grill, netting and fencing, welded at the inter-section, of wire with a maximum cross-sectional dimension of 3 mm (0118 inch) or more and having a mesh size of 100 cm2 (155 square inches) or more (concrete reinforcement mesh)	-0.6017	-0.8970	-0.6709	-0.6570	-0.9694	-0.9734	-0.6105	-0.7197	-0.5912	-0.4332	-0.6249	-0.6584	-0.90	-0.90
731431	Grill, netting, welded junctions, zinc plated/coated	-0.6180	-0.7735	-0.9152	-0.9069	-0.9350	-0.9359	-0.9398	-0.8048	-0.8480	-0.8575	-0.8825	0.1859	-0.90	-0.90
731439	Grill, netting, welded junctions, nes	-0.0862	-0.8243	-0.0753	-0.7044	-0.4582	-0.9105	-0.1731	-0.8043	0.1169	-0.6174	-0.1335	-0.4663	-0.30	-0.80
731441	Grill, netting, fencing, iron or steel, plated or coated with zinc	-0.0743	-0.0260	-0.7025	-0.6544	-0.6858	-0.4410	-0.8750	-0.7338	0.0772	0.2345	-0.1268	-0.5751	-0.70	-0.50
731442	Grill, netting, fencing, iron or steel, plastic coated	0.5260	0.6472	-0.5318	-0.3139	-0.7054	-0.3551	-0.5008	-0.3116	-0.4640	0.0129	0.5943	0.7872	-0.60	-0.30
731449	Grill, netting, fencing, iron or steel, nes	-0.5320	-0.7530	-0.8853	-0.8556	-0.6175	-0.7342	-0.2990	-0.5769	-0.4677	-0.2665	-0.7588	-0.3504	-0.80	-0.80
731450	Expanded metal, iron or steel	-0.9173	-0.9070	-0.9575	-0.8994	-0.9681	-0.9343	-0.9680	-0.9549	-0.9550	-0.8881	-0.8714	-0.2031	-1.00	-0.90

731511	Chain, roller, iron or steel	0.9478	0.7330	-0.2096	-0.8156	0.0907	-0.6273	0.7734	0.0889	0.3820	-0.5416	0.8233	0.3575	0.00	-0.70
731512	Chain, articulated link, iron or steel, nes	0.6887	0.2172	0.2010	-0.1096	-0.2460	-0.6443	0.3864	0.2467	-0.1355	-0.5333	0.4163	0.2902	-0.10	-0.50
731519	Chain parts, articulated link, iron or steel	0.5973	-0.0166	-0.3090	-0.8855	-0.3033	-0.7898	0.1704	-0.1367	-0.3779	-0.7639	0.5766	-0.3687	-0.30	-0.80
731520	Chain, skid, iron or steel	-0.1197	-0.2129	-0.9650	-0.9669	-0.9899	-0.9854	-0.9563	-0.2518	-0.9565	-0.9066	-0.9355	-0.4469	-1.00	-1.00
731581	Chain, stud link, iron or steel	0.0385	-0.6151	-0.9599	-0.9781	-0.8910	-0.9056	-0.6840	0.3599	-0.5191	-0.8684	0.3433	-0.2402	-0.90	-1.00
731582	Chain, welded link, iron or steel, nes	-0.9009	-0.8814	-0.9668	-0.9555	-0.9719	-0.9529	-0.9583	-0.9028	-0.9073	-0.8643	-0.8736	-0.6296	-1.00	-0.90
731589	Chain, iron or steel, nes	0.7315	-0.4851	0.3443	-0.7707	0.5302	-0.6319	0.9161	0.4105	0.6178	-0.4621	0.7367	-0.1537	0.50	-0.70
731590	Chain parts, iron or steel, nes	0.3882	0.2885	0.0959	-0.1365	-0.3984	-0.4418	0.2700	0.7827	0.0630	-0.4449	0.5976	0.5538	-0.20	-0.30
731600	Anchors, grapnels and parts thereof of iron or steel	0.4494	0.0208	-0.3474	-0.4238	-0.0343	-0.2819	-0.2943	0.6818	-0.0894	-0.3297	-0.1681	-0.3116	-0.20	-0.30
731700	Nails, staples& similar articles, iron or steel, excluding article of head No 8305 and articles with copper heads	-0.5387	-0.4931	-0.9133	-0.8966	-0.8231	-0.7734	-0.6941	-0.6108	-0.6666	-0.5336	-0.4912	-0.4103	-0.90	-0.80
731811	Screws, coach, iron or steel	0.9952	0.9859	0.9664	0.8507	0.9289	0.7731	0.9970	0.9724	0.9736	0.8706	0.9862	0.9629	0.90	0.80
731812	Screws, wood, iron or steel, nes	0.6790	0.4866	-0.8836	-0.6712	-0.8996	-0.7416	-0.0079	0.6341	-0.2680	-0.1396	0.5833	0.6938	-0.90	-0.70
731813	Screw hooks and screw rings of iron or steel	0.6908	0.1030	-0.2001	-0.7445	-0.4691	-0.7834	0.5071	0.3789	-0.7689	-0.8322	0.5804	-0.4866	-0.40	-0.80
731814	Screws, self-tapping, iron or steel	0.0202	0.8019	-0.9889	-0.8486	-0.9879	-0.8421	-0.6104	0.4848	-0.9591	-0.5317	-0.8971	0.6578	-1.00	-0.80
731815	Bolts or screws nes, with or without their nuts or washers, iron or steel	0.7730	0.7402	-0.2249	-0.1771	-0.1002	-0.0535	0.7111	0.6667	-0.0234	0.0028	0.6097	0.7393	-0.10	-0.10
731816	Nuts, iron or steel, nes	0.8784	0.9327	-0.3895	-0.0424	-0.0801	0.2745	0.6606	0.8063	-0.2193	0.0700	0.7864	0.9110	-0.20	0.10

731819	Threaded articles of iron or steel, nes	0.7093	0.9260	0.1240	0.4073	-0.0071	0.2663	0.7800	0.8846	0.3252	0.5395	0.7938	0.8847	0.10	0.40
731821	Washers, spring or lock, iron or steel	0.9436	0.6164	0.1071	-0.0609	-0.3068	-0.4894	0.6937	0.5293	0.1660	-0.0899	0.8949	0.6092	-0.10	-0.30
731822	Washers, iron or steel, nes	0.7728	0.8556	-0.0539	0.0253	0.1436	0.1786	0.5796	0.6032	0.0916	0.0751	0.8181	0.2598	0.10	0.10
731823	Rivets, iron or steel	0.0505	0.2395	-0.7790	-0.7149	-0.7465	-0.6864	-0.4210	0.0076	-0.8396	-0.8051	-0.1297	0.3322	-0.80	-0.70
731824	Cotters and cotter-pins, iron or steel	0.5111	0.4891	-0.6606	-0.6285	-0.4998	-0.4786	-0.1456	-0.0365	-0.7398	-0.7681	0.4758	-0.0004	-0.60	-0.60
731829	Non-Threaded articles of iron or steel, nes	0.8000	0.6627	0.1890	0.1651	-0.3380	-0.4075	0.4789	0.4773	-0.3609	-0.3883	0.5889	0.5226	-0.20	-0.20
731910	Needles, sewing, darning or embroidery, iron or steel			0.7284	-1.0000									0.90	-1.00
731920	Pins, safety, iron or steel	0.9217		-0.3657	0.8563	0.4533		0.7939		-0.0665		0.8474		0.00	0.90
731930	Pins, iron or steel, nes	0.8897	0.9462	-0.3457	-0.3087	0.7105	0.7447	0.9020	0.9692	-0.1379	0.3558	0.7263	0.9263	0.00	0.10
731990	Articles for use in the hand, iron or steel, similar to sewing needles or pins	0.9454	0.9781	0.3452	0.4907	0.7120	0.7808	0.8634	0.9600	0.6474	0.8502	0.9333	0.9577	0.60	0.70
732010	Springs, leaf and leaves there-for, iron or steel	0.0466	0.9014	0.5364	0.2539	0.0169	-0.0002	-0.4369	-0.5528	0.1982	0.1867	0.9398	0.9123	0.10	0.00
732020	Springs, helical, iron or steel	-0.0132	0.1950	-0.7793	-0.8681	-0.9036	-0.9358	-0.8484	-0.9213	-0.8960	-0.9394	-0.5637	-0.3711	-0.90	-0.90
732090	Springs, iron or steel, nes	0.7651	0.7615	0.0056	0.0357	-0.3266	-0.3861	0.3817	0.3483	0.0075	-0.0854	0.3974	0.3035	-0.20	-0.20
732111	Cooking appliances & plate warmers for gas fuel or both gas & other fuels,iron or steel	-0.4683	-0.9164	-0.8254	-0.9326	-0.8457	-0.8970	-0.9083	-0.9607	-0.7644	-0.8900	-0.1996	-0.1819	-0.80	-0.90
732112	Cooking appliances & plate warmers for liquid fuel, iron or steel	0.0375	0.3962	-0.6320	-0.6107	-0.1671	0.3423	0.5044	0.6086	-0.2472	0.0373	0.7580	0.8280	-0.40	-0.30

732113	Cooking appliances & plate warmers for solid fuel, iron or steel	-0.9361	-0.6976	-0.9903	-0.9874	-0.9802	-0.9647	-0.9180	-0.7698	-0.9678	-0.9267	-0.6197	-0.7193	-1.00	-1.00
732181	Other Non-electric Domestic Appliances For gas fuel or for both gas and other fuels	0.1257	-0.4452	-0.9610	-0.9656	-0.9050	-0.9406	-0.7263	-0.8972	-0.8934	-0.9671	-0.8342	-0.9181	-0.90	-1.00
732182	Other Non-electric Domestic Appliances For liquid fuel	-0.9682	-0.9284	-0.9981	-0.9981	-0.9974	-0.9918	-0.7994	-0.7927	-0.9877	-0.9608	-0.9968	-0.9932	-1.00	-1.00
732183	Other Non-electric Domestic Appliances For solid fuel	-0.0608	0.4949	-0.9381	-0.7810	-0.9845	-0.9541	-0.6989	-0.1756	-0.9483	-0.7119	-0.8374	-0.0403	-1.00	-0.90
732190	Parts of Cooking Appliances, Plate Warmers and Other Appliances	-0.5331	-0.1003	-0.8853	-0.7247	-0.9035	-0.7144	-0.8752	-0.5649	-0.8489	-0.4857	-0.5486	-0.0362	-0.90	-0.70
732211	Radiators and parts thereof, cast iron		0.0675	-0.6021	-0.8004	-0.4920	-0.7298	0.9488	0.4306	0.2635	0.0956	0.8654	0.4822	-0.50	-0.70
732219	Radiators and parts thereof, iron or steel, other than cast iron	0.4814	-0.0829	-0.7135	-0.9384	-0.8982	-0.9768	0.8657	0.3988	0.1008	-0.5217	0.6664	-0.4502	-0.80	-1.00
732290	Air heaters, hot air distributors, iron or steel & identifiable parts, nes	0.3992	0.2517	-0.5743	-0.7609	-0.8600	-0.9193	-0.6595	-0.8264	-0.9312	-0.9633	-0.5000	-0.4811	-0.80	-0.90
732310	Iron or steel wool; pot scourers and scouring or polishing pads, gloves and the like	-0.2516	-0.2755	-0.0065	-0.2628	0.3304	0.3396	0.2170	0.1805	0.2515	0.4601	0.7721	0.8567	0.20	0.00
732391	Table, kitchen or other house-hold articles of cast iron, not enamelled	0.9759	0.3007	0.6266	-0.3864	0.8866	0.4950	0.9675	0.9565	0.7861	0.4678	0.9877	0.8504	0.80	0.00
732392	Table, kitchen or other household articles of cast iron, enamelled	0.0100	0.0733	-0.4263	-0.6953	-0.6876	-0.7659	0.0466	0.0621	-0.3110	-0.4194	0.6807	0.0209	-0.60	-0.70
732393	Table, kitchen or other house-hold articles of stainless steel	0.9562	0.9527	0.3549	0.3121	0.6319	0.6058	0.9034	0.9117	0.8374	0.8277	0.8807	0.9455	0.60	0.50
732394	Table, kitchen or other house-hold articles & parts thereof, iron or steel, enamelled, nes	0.9494	0.9544	0.9173	0.8321	0.9595	0.8989	0.9687	0.9346	0.9822	0.9351	0.9969	0.9954	0.90	0.90

732399	Table, kitchen or other household articles & parts thereof, of iron or steel, nes	0.8697	0.9026	0.2029	-0.1136	0.5038	0.6079	0.8779	0.9173	0.8000	0.8590	0.8648	0.9371	0.40	0.30
732410	Sinks and wash basins, stainless steel	0.2911	-0.4107	-0.4045	-0.8681	-0.5166	-0.8021	-0.3705	-0.7233	0.1689	-0.3577	0.3418	0.1672	-0.40	-0.80
732421	Baths, cast iron, enamelled or not	0.6593	-0.2363	-0.0931	-0.9373	0.0752	-0.8987	0.9389	-0.2235	0.5081	-0.7694			0.10	-0.90
732429	Baths, iron or steel, nes	0.3292	0.4720	0.4179	-0.2216	-0.4392	-0.7288	0.7704	0.5027	0.3367	-0.2288	0.6041	0.1509	-0.20	-0.50
732490	Sanitary ware & parts thereof, iron or steel, nes, for example bedpans, douche cans	-0.1146	-0.4878	-0.3384	-0.7561	-0.1468	-0.6367	0.5825	0.2280	0.0559	-0.3753	0.4026	0.0086	-0.20	-0.70
732510	Cast articles of non-malleable cast iron nes	0.9131	0.9763	0.5330	0.5380	0.0920	0.0387	0.8312	0.7111	0.8479	0.7523	0.8855	0.8530	0.30	0.30
732591	Balls, grinding and similar articles of iron or steel, cast for mills	0.6353	0.6235	0.7621	0.8890	0.8561	0.9560	0.5628	0.8160	0.8038	0.8449	0.5020	0.7429	0.80	0.90
732599	Articles of iron or steel, cast, nes	0.9911	0.9905	0.8959	0.9079	0.8059	0.8250	0.9797	0.9669	0.8781	0.8978	0.9638	0.9719	0.80	0.80
732611	Grinding Balls and Similar Forged or Stamped Articles for Mills	0.0480	-0.6837	0.1993	-0.5660	0.3673	-0.2329	-0.5074	-0.7668	0.2843	-0.3712	-0.7725	-0.8677	0.10	-0.50
732619	Articles of iron or steel, forged or stamped, but not further worked	0.9719	0.9849	0.7424	0.8640	0.3841	0.6595	0.5012	0.6292	0.4419	0.6825	0.8172	0.8851	0.50	0.70
732620	Articles of wire, iron or steel, nes	0.4426	0.8654	-0.1904	0.1893	-0.3034	0.1985	-0.0025	0.5248	-0.0588	0.4970	0.2521	0.7651	-0.20	0.30
732690	Articles, iron or steel, nes	0.2214	0.4900	-0.0926	-0.0715	-0.3595	-0.2151	0.0767	0.1401	-0.1154	-0.0714	0.1536	0.4634	-0.20	-0.10

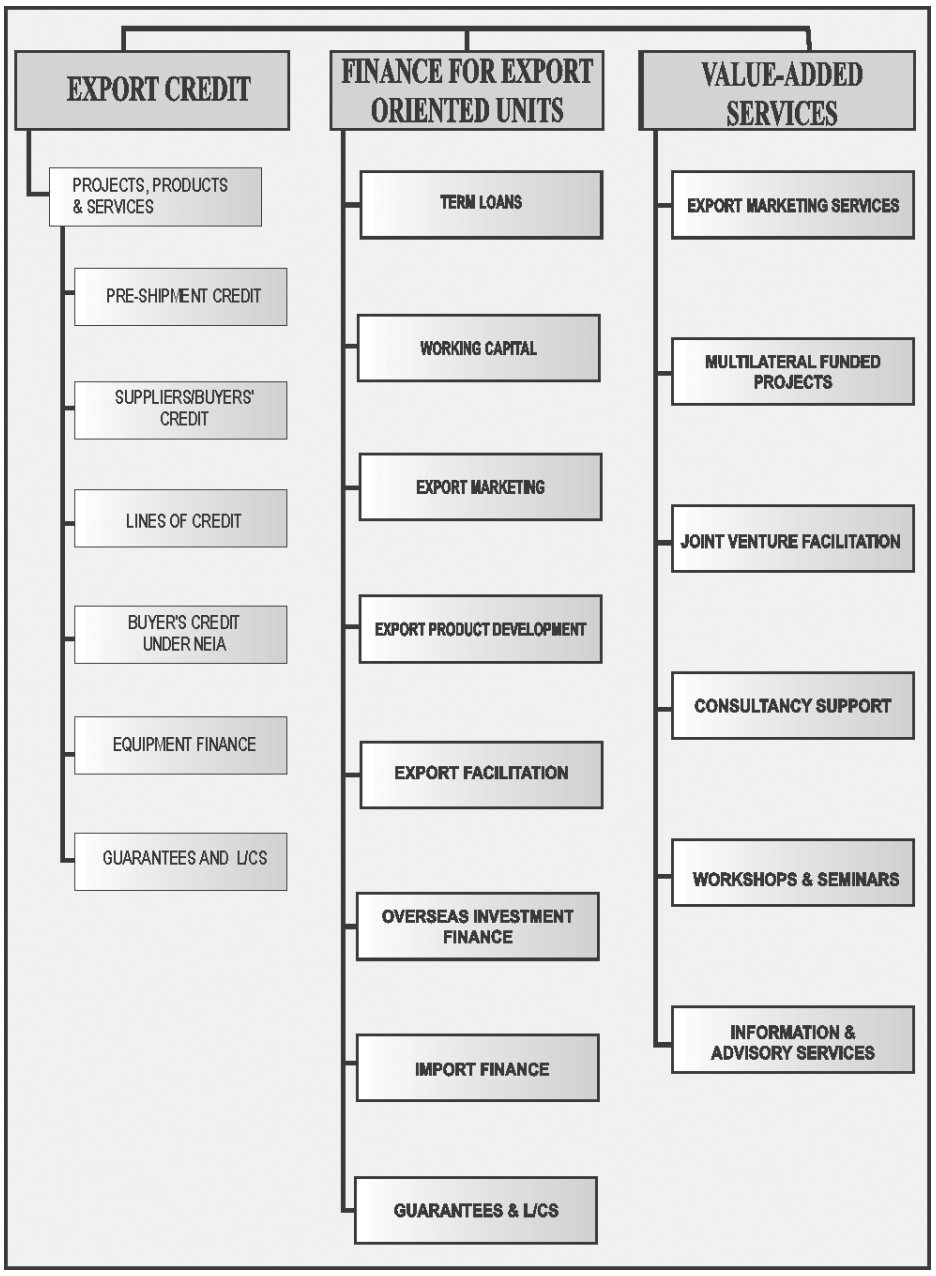
RECENT OCCASIONAL PAPERS

OP. No.	Title
106.	ASEAN Countries: A Study of India's Trade and Investment Potential
107.	Essays on Globalisation and Wages in Developing Countries
108.	Select West African Countries: A Study of India's Trade and Investment Potential
109.	Indian Leather Industry: Perspective and Export Potential
110.	GCC Countries: A Study of India's Trade and Export Potential
111.	Indian Petroleum Products Industry : Opportunities and Challenges
112.	Floriculture : A Sector Study
113.	Japanese & U.S. Foreign Direct Investments in Indian Manufacturing : An Analysis
114.	Maghreb Region: A Study of India's Trade and Investment Potential
115.	Strengthening R & D Capabilities in India
116.	CIS Region: A Study of India's Trade and Investment Potential
117.	Indian Chemical Industry: A Sector Study
118.	Trade and Environment: A Theoretical and Empirical Analysis
119.	Indian Pharmaceutical Industry : Surging Globally
120.	Regional Trade Agreements: Gateway to Global Trade
121.	Knowledge Process Outsourcing: Emerging Opportunities for India
122.	Indian Mineral Sector and its Export Potential
123.	SAARC: An Emerging Trade Bloc
124.	Indian Capital Goods Industry - A Sector Study
125.	Financial Liberalization and Its Distributional Consequences
126.	ECOWAS: A Study of India's Trade and Investment Potential
127.	Indian Textile and Clothing Industry in Global Context: Salient Features and Issues
128.	Fair Trade : Fair Way of Enhancing Export Value
129.	Indian Automotive Industry: At The Crossroads
130.	CARICOM : A Gateway to the America
131.	IBSA : Enhancing Economic Cooperation Across Continents
132.	MSMEs and Globalisation: Analysis of Institutional Support System in India and In Select Countries
133.	International Trade, Finance and Money: Essays in Uneven Development
134.	Sikkim: Export Potential and Prospects
135.	Mizoram: Export Potential and Prospects
136.	Floriculture: A Sector Study
137.	Biotechnology Industry in India: Opportunities for Growth
138.	Indian Gems and Jewellery: A Sector Study
139.	SADC: A Study of India's Trade and Investment Potential
140.	Innovation, Imitation and North South Trade: Economic Theory and Policy
141.	COMESA (Common Market for Eastern and Southern Africa): A Study of India's Trade and Investment Potential

142. Indian Shipping Industry: A Catalyst for Growth
143. New Renewable Energy in India: Harnessing the Potential
144. Caribbean Community (CARICOM): A Study of India's Trade and Investment Potential
145. West African Region: A Study of India's Trade and Investment Potential
146. India's Trade and Investment Relations with LDCs (Least Developed Countries): Harnessing Synergies
147. Indian Electronic Industry : Perspectives and Strategies
148. Export Potential of Indian Plantation Sector: Prospects and Challenges
149 MERCOSUR : A Study of India's Trade and Investment Potential
150. Openness and Growth of the Indian Economy: An Empirical Analysis
151. The Commonwealth: Promoting a Shared Vision on Trade and Investment
152. Southern African Development Community (SADC): A Study of India's Trade and Investment Potential
153. Strategic Development of MSMEs: Comparison of Policy Framework and Institutional Support Systems in India and Select Countries
154. Indian Chemical Industry : Exploring Global Demand
155. Technological Interventions In Indian Agriculture for Enhancement of Crop Productivity
156. Exports of Services and Offshore Outsourcing: An Empirical Investigation in the Indian Context
157. Indian Ocean Rim Association for Regional Co-operation (IOR-ARC): A Study of India's Trade and Investment Potential
158. West Africa: A Study of India's Trade and Investment Potential
159. The Effects of Financial Openness: An Assessment of the Indian Experience
160. Comparison of Labour Laws: Select Countries
161. India's Trade and Investment Relations with Cambodia, Lao PDR, Myanmar, Vietnam (CLMV): Enhancing Economic Cooperation
162. Indian Horticulture-Imperatives to Enhance Trade from India
163. India's Trade and Investment Relations with Gulf Cooperation Council (GCC): Strengthening Economic Ties
164. India's Hi-Tech Exports: Potential Markets and Key Policy Interventions
165. Outward Direct Investment from India: Trends, Objectives and Policy Perspectives
166. East African Community (EAC): A Study of India's Trade and Investment Potential
167. Trade Liberalization, Product Variety and Growth
168. Research & Development in BRICS: An Insight
169. Indian Capital Goods Industry: A Sector Study
170. Bangladesh: A Study of India's Trade and Investment Potential
171. Indian Electronic Goods Industry: Neutralizing Trade Deficit with China

EXIM BANK'S MAJOR PROGRAMMES

Bank's Major Programmes



EXPORT-IMPORT BANK OF INDIA

HEAD OFFICE

Centre One Building, Floor 21, World Trade Centre Complex, Cuffe Parade, Mumbai 400 005.
Phone : (91 22) 22172600 Fax : (91 22) 22182572 E-mail : pf@eximbankindia.in
Website : www.eximbankindia.in

LONDON BRANCH

5th Floor, 35, King Street, London - EC2V8BB, United Kingdom,
Phone : (44) 20 77969040 Fax : (44) 20 76000936 E-mail: eximlondon@eximbankindia.in

INDIAN OFFICES

Ahmedabad
Sakar II, Floor 1 ,
Next to Ellisbridge Shopping Centre, Ellisbridge P. O.,
Ahmedabad 380 006.
Phone : (91 79) 26576852/26576843
Fax : (91 79) 26577696
E-mail : eximahro@eximbankindia.in

Bangalore
Ramanashree Arcade, Floor 4,
18, M. G. Road, Bangalore 560 001.
Phone : (91 80) 25585755/25589101-04
Fax : (91 80) 25589107
E-mail : eximbro@eximbankindia.in

Chandigarh
PHD House, Floor 1, Sector 31-A, Dakshin Marg,
Chandigarh 160 031
Phone : (91 172) 2641910/12/39/49
Fax : (91 172) 2641915
E-mail : eximcro@eximbankindia.in

Chennai
Overseas Towers, Floors 4 & 5, No. 756-L,
Anna Salai (Opp. TVS), Chennai - 600 002.
Phone : (91 44) 28522830, 28522831
Fax : (91 44) 28522832
E-mail : eximchro@eximbankindia.in

Guwahati
NEDFI House, Floor 4, G. S. Road,
Dispur, Guwahati-781006
Phone : (91 361) 2237607, 2237609
Fax : (91 361) 2237701
E-mail : eximgro@eximbankindia.in

Hyderabad
Golden Edifice, Floor 2, 6-3-639/640, Raj Bhavan Road,
Khairatabad Circle, Hyderabad 500 004.
Phone : (91 40) 23307816-21 Fax : (91 40) 23317843
E-mail : eximhro@eximbankindia.in

Kolkata
Vanijya Bhawan, Floor 4, (International Trade
Facilitation Centre), 1/1 Wood Street, Kolkata 700 016.
Phone : (91 33) 22833419/22833420
Fax : (91 33) 22891727
E-mail : eximkro@eximbankindia.in

New Delhi
Statesman House, Ground Floor,
148, Barakhamba Road, New Delhi 110 001.
Phone : (91 11) 23474800
Fax : (91 11) 23322758/23321719
E-mail : eximndro@eximbankindia.in

Pune
44, Shankarseth Road, Pune 411 037.
Phone : (91 20) 26403000
Fax : (91 20) 26458846
E-mail : eximpro@eximbankindia.in

OVERSEAS OFFICES

Addis Ababa
Bole Kifle Ketema, Kebele - 19, (03/05)
House No. 015-B,
Addis Ababa, Ethiopia
Phone : (251 116) 630079
Fax : (251 116) 610170
Email : aaro@eximbankindia.in

Dubai
Level 5, Tenancy 1B,
Gate Precinct Building No. 3,
Dubai International Financial Centre,
PO Box No. 506541, Dubai, UAE.
Phone : (971 4) 3637462
Fax : (971 4) 3637461
E-mail : eximdubai@eximbankindia.in

Johannesburg
Atrium on 5th, Floor 2, Tower East,
Sandton City, Johannesburg,
South Africa
Phone : (27 11) 3265103/13
Fax : (27 11) 7844511
E-mail : eximjro@eximbankindia.in

Singapore
20, Collyer Quay,
10-02, Singapore 049319.
Phone : (65) 65326464
Fax : (65) 65352131
E-mail : eximsingapore@eximbankindia.in

Washington D.C.
1750 Pennsylvania Avenue NW,
Suite 1202, Washington D.C. 20006,
United States of America.
Phone : (1 202) 223 3238
Fax : (1 202) 785 8487
E-mail : eximwashington@eximbankindia.in

Yangon
House No. 54/A, Ground Floor,
Boyarnyunt Street,
Dagon Township,
Yangon, Myanmar.
Phone : (95) 1389520
Mob. : (95) 931281726
Email : eximyangon@eximbankindia.in