On the Cover

Opportunities and Challenges of the Indian Steel Industry

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Understanding **Incredible India**

"Incredible India" is the slogan of an international marketing campaign launched by the central government of India in 2002 to promote international tourism. Upon landing at Indira Gandhi International Airport, the first thing visitors see might be this logo alongside beautiful pictures of India. Since its inception, the slogan has been widely applied for describing not only India's spectacular tourism resources, but also the economic miracle of GDP growth surpassing 7%. However, this term is also used with a negative meaning: ""Nothing is possible, but nothing is impossible," because of bureaucratism. This article describes 'Incredible India', in particular the experience under the Modi administration.

The country is undergoing a great transition as the post-reform generation strikes out into the world. The thinking, political preferences, and consumption patterns of the generation born after India's economic reforms of 1991 differ greatly from those of their elders. Unlike past generations, they are quick to access and acquire new information and adapt to the changing global trends as citizens of the world.

Of course, this change is a phenomenon taking place mainly in the big cities, but it is increasingly spreading to small towns and rural localities as the Indian economy grows. Filled with pride for being an Indian, this generation supports growth-oriented domestic economic development creating job opportunities and a strong India internationally.

This change seems to have accelerated even further after Prime Minister Narendra Modi took office in 2014. The combination of Prime Minister Modi and the post-reform generation has brought about positive changes in terms of growth and strength, but on the other hand, reveals other aspects of Incredible India—"Hindu's India" and "Modi's India."

Building a strong India based on growth-oriented economic development

At the onset of the Modi administration, India's economic paradigm shifted its focus from dis-

Table 1. India's Major Economic Indicators

	2012-13	2013-14	2014-15	2015-16	2016-17
GDP growth (%)	5.5	6.4	7.5	8.0	7.1
Manufacturing growth (%)	6.2	5.3	7.5	10.8	7.9
Retail price (%)	10.9	6.4	5.9	4.9	4.5
Industrial production (%)	3.3	3.4	4.0	3.4	5.0
Fiscal deficit (% of GDP)	4.9	4.5	4.1	3.9	3.5
Trade balance ($1 billion)	–190.3	–135.8	–137.6	–118.7	–105.7

Source: Office of Economic Adivisor, "Key Economic Indicators", 2017.6.22

tributive or inclusive growth to growth-oriented development. As a result, companies around the world turned keen attention to the Indian market. In 2016, Apple announced its plan to open a USD 25 million technology development center in Hyderabad. CEO Tim Cook himself made this decision, perceiving India as an important market for his company over the next decade. Apple is not alone in viewing the Indian economy positively.

Major institutions including the World Bank, the Asian Development Bank, IMF, and OECD have issued positive outlooks for the Indian economy. 2017 may prove slower than had been expected a year before, but it is still likely to record economic growth over 7%. In the short term, India's economic growth seems to be in decline due to the temporary impact of last year's demonetization and the unification of state-by-state value added taxes into a Goods and Services Tax (GST). However, in the long term, such changes will prove to have a positive impact.

As seen in Table 1, India's GDP growth stood at 5.5% in 2012-13, but began to pick up as the Modi administration took power in 2014. It has remained over 7% since.

As the Chinese economy began to slow apace with the recovery of the Indian economy, India has been capturing global attention once again. In the fourth quarter of 2014, India for the first time overtook China in terms of GDP growth. The Indian government officially announced that GDP growth surged to 7.5% compared with China's 7.3%. Major global institutions including the World Bank and Goldman Sachs, also began forecasting that India's GDP growth will surpass China's.

There is a slim possibility that such high GDP growth in India will prove only a temporary phenomenon. From a structural perspective, India is highly likely to continue to expand at least until 2025-30. Unlike China, India's economically active population will continue growing at least until 2025. Currently, half of the 1.3 billion Indians are under 25 years of age. The average age in the country is 29, far below China's 37. Naturally, India is anticipated to enjoy a high demographic

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dividend, as the proportion of working people in the total population grows, GDP growth rate rises, as suggested by Moody's.

From a market perspective, India's economic outlook is fairly bright. Economic growth in the country is built on domestic demand, contrasting with China's pursuit of export-driven growth. This suggests that India is far less vulnerable to global economic fluctuations. What is more important, however, is that the post-reform generation will lead India's domestic market. Unlike former generations, the young people in this generation possess high levels of education and lead consumption-oriented lives.

Falling global oil prices in the initial years of the Modi administration also contributed to high GDP growth rate in India. With the price decline in oil , which represent almost 35% of India's total imports, current account deficits have plunged and overall production costs have declined, but purchasing power has improved and commodity prices have stabilized. This sustained rapid growth surpassing 7% can be attributed to external factors, as stated above, but most of all, it is driven by Modi's "growth-oriented India" project. Upon his landslide victory in the general elections of 2014, his party became the ruling party with a majority of seats in the Parliament and showed a strong will to implement his project.

To achieve this "growth-oriented India" goal, a series of so-called Modinomics campaigns were announced: "Make in India", "Digital India", "Skill India", "Smart Cities", and "Clean India." Among these, the key initiative is "Make in India," which aims to nurture manufacturing. Prime Minister Modi has proposed his "3D" mantra for the drive to increase foreign direct investment (FDI) in Indian manufacturing. The 3D mantra—Democracy, Demography, and Demand—seems to concern its competitor, China.

As Japan and the West hailed this "Make in India" initiative, FDI in India surged by 35.9% from USD 18.94 billion over the nine months from October 2013 to June 2014 to USD 25.75 billion for the first nine months (October 2014 – June 2015) under the Modi administration. Total

FDI in India continued rising, and reached USD 60.1 billion in 2016-17. This increase in FDI is the major breakthrough of Modinomics. However, underlying the high economic growth are many issues to be addressed. Alongside growth, the concentration of wealth has been intensified not only by class but also by region, spreading economic disparity across the entire society.

The Modi administration is spurring the creation of a strong India. The country is showing determination to counter increasing Chinese influence and maximize its interests in terms of defense and security. This has brought about the positive impact that India's defense has been promoted, but also side effects in that conflicts with China have been aggravated and the social welfare budget has been reduced to offset rising defense expenditures.

Hindu's India, a double-edged sword for the Modi administration

The Indian general elections of 2014 marked a revival of Hindu fundamentalism. Following the end of the Vajpayee administration in 2004, his Bharatiya Janata Party (BJP) and Hindu fundamentalists rapidly declined in power. One decisive factor was the lack of a nationally popular leader from the BJP to succeed Prime Minister Atal Bihari Vajpayee. To make matters worse, the Brahmin, a caste that traditionally provided loyal supporters to the BJP, turned their back on the party.

The reason was quite simple: they were struggling to make a living. Under the BJP and Prime Minister Vajpayee, India enjoyed high GDP growth of around 7-8%, but the living standards of most Hindus, including the Brahmin caste, did not improve due to high inflation. Corporations and the well-educated middle class deepened their pockets, but average religious Hindus found their living standards unimproved. Therefore, the BJP was desperate for a leader who could reignite the Hindu base and improve the life of each and every Indian.

Gujarat Chief Minister Narendra Modi,

Figure 1. India's Hindi Belt and Cow Belt

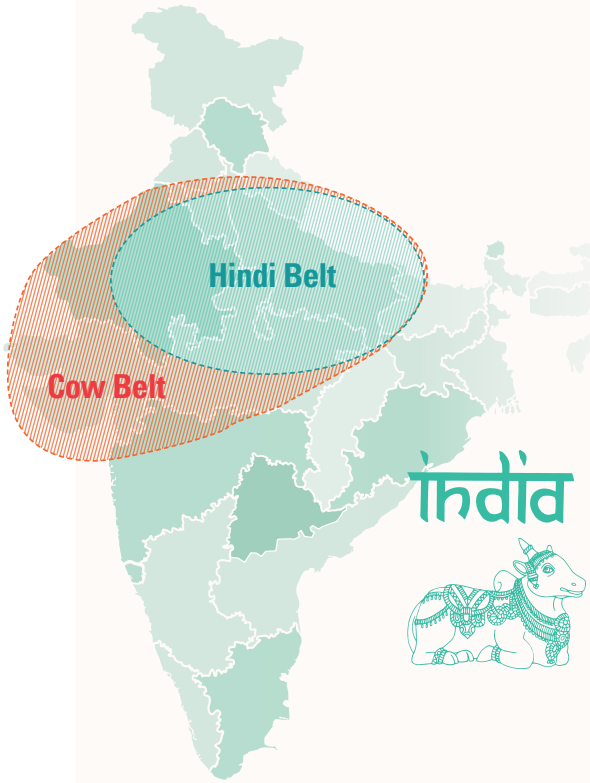
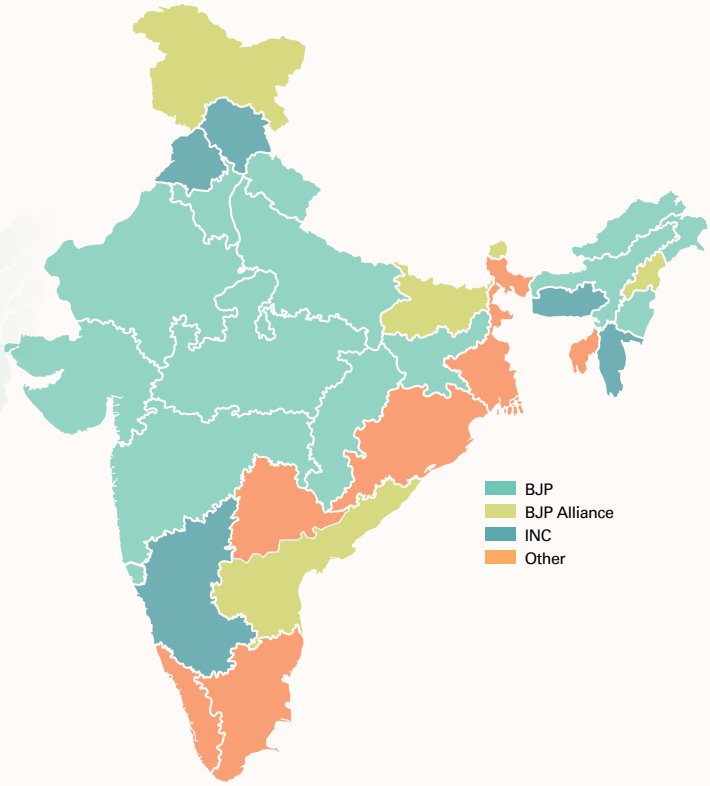


Figure 2. Indian States by Ruling Party



Source: https://en.wikipedia.org/wiki/National_Democratic_Alliance_(india)

seemed to meet these qualifications and emerged as a hope for reviving the BJP and Hindu fundamentalism. Taking advantage of the Modi brand, the BJP won a landslide victory in the 2014 general elections. Mr. Modi's image as a hawkish Hindu and an icon of economic development won overwhelming support in the Hindi belt, a linguistic region in north-central India where Hindi is widely spoken, and the "cow belt", covering most of the Hindi-speaking heartland of India along with Gujarat and Maharashtra where the Hindu fundamentalism is strong and the majority considers the cow to be sacred. Projecting a strong image of a capacity to realize both the establishment of a Hindu state and further economic development, Modi won the hearts of the majority of Hindu voters in these north-western Indian states.

Among the 29 states and seven federal territories (including Delhi) in India, the BJP won 201 of its 282 seats (71%) in just seven states falling within the Hindi belt and cow belt. It gained 166 more seats in the 2014 elections than it had in

the 2009 elections.

Since Prime Minister Modi took office, the efforts of Hindu fundamentalists have reached into every nook and cranny of Indian society. Even during the US presidential election campaign, Hindu fundamentalists openly showed their intention to build a "Hindu's India." In May 2016, members of Hindu Sena, one of the fundamentalist organizations, held a spiritual ritual to pray for the victory of US presidential candidate Donald Trump. In June 2017, they even celebrated the birthday of the US politician. They support Trump for the simple reason that they perceive him to share their hostility toward Islam and Muslims.

Recently, a Muslim man was killed in Uttar Pradesh in an attack by several right-wing Hindu men for allegedly eating beef. In order to create a Hindu state, Hindu fundamentalists are not reluctant to persecute Muslims and people from the lowest Dalit caste. These so-called "cow protection vigilantes" flogged four young Dalit workers for skinning a dead cow. This image spread quickly on the internet and sparked clashes in India as the Dalit community staged protests. Ultimately, Prime Minister Modi himself stepped forward to stress the importance of the rule of law.

What is more worrisome is that the Hindu fundamentalist base continues to expand. One good example is the victory of the BJP in the Assam legislative assembly election of 2016. This was the first time in history that the BJP won elections in northeastern India, the traditional stronghold of the Indian National Congress (INC). With relatively large proportions of Christians and Muslims in Assam, it has been difficult for the Hindu fundamentalist BJP to expand its political influence, but it finally managed to win the state. As of 2017, the BJP-led coalition controls 18 of 29 states. This will certainly work in favor of Modi in the next general elections of 2019.

Source: Shutterstock

The expanded clout of Hindu fundamentalism is a double-edged sword for Prime Minister Modi and the ruling BJP. For a short term, their expanded influence is helpful to consolidate power and implement various measures to stabilize the regime. Over the long term, it will pose a threat to the country as it pursues stability, integration of society, and national development. Depending on how the Modi administration wields this double-edged weapon, the meaning of Incredible India will change substantially in the future.

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Opportunities and Challenges of the Indian Steel Industry in the Context of Future Growth

India has always been seen as a potential for significant steel market expansion. There have been various forecasts at different points, raising expectation of the steel industry and investors about growth prospects of the industry. In the recently adopted steel policy of the government of India, it has stated that India's crude steel production capacity will have to reach 300 Mt by the year 2030-31, from the current level of about 125 Mt, which incorporates a domestic finished steel consumption forecast of about 225 Mt and export of about 20 Mt. The first question that immediately comes to one's mind is how realistic are these numbers? Are these underestimates or are grossly exaggerated?

Much of these forecasts are based on some very simple observations. One, the country's per capita steel consumption has been low, lying way below the global average. Two, it is a huge country with a large population that will require significant steel intensive infrastructure for transport, housing, energy production and distribution, and urban living. Three, manufacturing still has a relatively small share in the gross domestic product (GDP) of the country.[1] Given the emerging opportunities from the global integration of the economy and growing domestic market for industrial products, the country's industrial

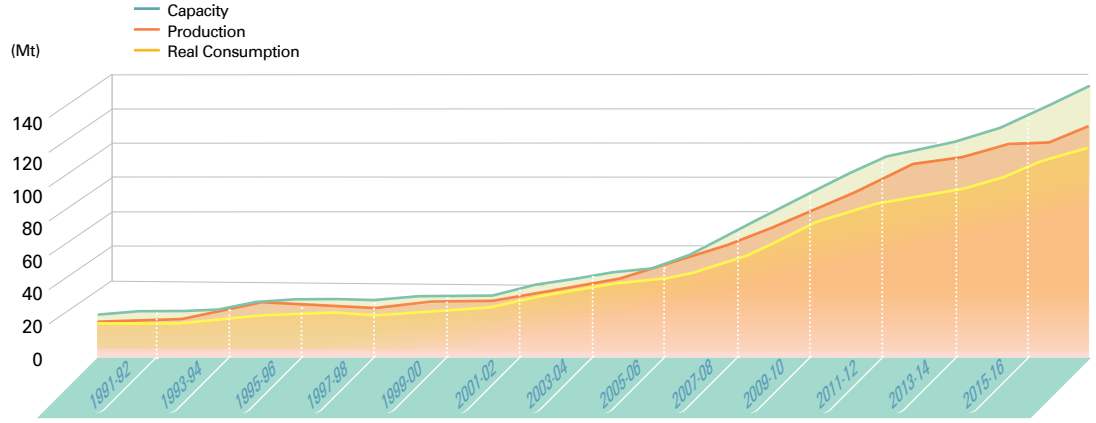
Table 1. Per Capita Finished Steel Use in Selected Countries

(kg)

No.	Countries	2011	2012	2013	2014	2015	2016
1	China	475.6	487.0	539.5	519.0	488.6	492.7
2	South Korea	1142.5	1089.9	1038.4	1108.8	1113.6	1130.2
3	Japan	503.7	503.0	513.8	533.9	497.3	492.6
4	USA	285.5	305.6	301.8	335.0	297.4	282.7
5	India	55.9	57.3	57.6	58.7	60.6	63.0
	World (average)	205.7	207.4	217.8	217.1	208.2	207.9

Source: World Steel in Figures 2016

Figure 1. Crude Steel Capacity, Production and Finished Steel Consumption Trend



Source: Joint Plant Committee

production infrastructure and the consumption base can rise significantly. All these will mean the country's demand for steel will rise gradually, if not sharply, to a high level. Hence, investment for new production capacity is a must.

However, in reality, India's steel consumption growth rates have been modest for decades untill around 2001-02 and only after that there was a pick up under the global trends. The growth rates moderated from 2012-13 and have not shown any sign of strengthening since then. Production trends have also followed a similar trend, although there are frequent divergences from one another mainly arising out of a lack of synchronization between production capacity built up and consumption growth.

This shows that there was something wrong in the very basis of the Indian steel industry's growth expectations. Either the very logic was flawed and, in reality, the structure or the steel market and industry have been driven by forces which tend to subsume the impact of these factors despite the fact that all the three factors have relevance in their own place.

Taking a quick look at the numbers, one sees that the country's per capital finished steel consumption lies at around 63 kg while the global average is at 208, according to the World Steel Association (worldsteel). If the country has to reach the global average in per capita consumption of 209 kg, assuming also a 1.1% average population growth, the total annual finished steel consumption in the country should rise to nearly 262 Mt by 2025-26. Steel industry experts and the Indian government have already scaled down, as stated earlier, the forecasts of domestic finished steel consumption to about 225 Mt by 2030-31. This is a significant departure from the earlier position held where the same was placed about 260 Mt by 2025-26. As far as steel intensity in GDP is concerned, the Indian scenario does not look so depressing. Both the observations are also to be seen in terms of the denominators: the population size being exceedingly large in the first case and GDP not being as large in the second. The point, howev-

1 15.01% in FY 2001 →16.17% in FY 2010 →16.50% in FY 2016

er, remains that per capita steel consumption has grown far too slowly despite the start being from a relatively low base.

The second factor assumes that a bigger economy will require more steel because steel-intensive infrastructure will be required to be built. The current infrastructure deficits are visible almost everywhere. Considering the overall growth potential and the government's plan to execute large-scale infrastructure development to support the needs of a growing economy, it is expected that a lot of steel-intensive projects will start. But, much of the success will depend on the growth of a competitive industrial sector. Here again, the current state of industrial growth in the country has not been very encouraging with a visible slowdown in manufacturing.[2] The problem is that both are related to each other and are interdependent. While low industrial growth has been attributed partly to the lack of adequate infrastructure, the lack of industrial development opportunities have also been a drag on infrastructure projects and inadequate funding support for the same. In recent times, investment in infrastructure has picked up mainly driven by government investment. The sustainability of this, however, remains questionable, as the government has many other priorities at hand, with the possibility of existing resources being utilized very thinly across widely diverse priority sectors. This may result in slower than expected investments in infrastructure if the private sector involvement here remains moderate. The private sector involvement in infrastructure has been far below expectation due to various regulatory constraints and the absence of robust business models that guarantee required returns on investment. The middle of way solution, that is, Public Private Partnership (PPP) model has worked in certain areas, but overall the effectiveness of this model has been limited and their applications have not been widespread. The difficulty is that the government has progressed well in projects that are easy to execute, such as highway construction, power generation, and IT infrastructure. Not much of real efforts have gone into building and modernizing railways as it requires relatively larger funds and is more complex in execution. Railways could have raised demand for steel and also produced a base for competitive growth of the transport economy to support general industrial development. Together, both infrastructure and industrial development could have raised the level of steel consumption in the country.

The Government perception about the steel industry in India

The steel industry is important for the government. That is why India has the Ministry of Steel. There are two major government-owned steel companies and a few others in the business of iron ore (NMDC Ltd.), and manganese ore (MOIL Ltd.) etc. The government today may not be policy-wise intent on having a large number of government-owned businesses including those in project management consultancy (Mecon Ltd.) and metal scrap trading (MSTC Ltd.). But, the legacy continues and much of the Ministry's

2 IIP Estimates, Ministry of Statistics and Programme Implementation.

The steel industry has always held a position of significant importance in the context of economic development and the government's policy space. Although the industry accounts for roughly 1.04% of the country's GDP. The Indian government has always believed that steel is the backbone of industrialization.

occupation remains confined to management of these enterprises rather than in attending to policy matters as the relevant policy space is largely determined by other ministries, such as the Ministry of Finance, the Ministry of Commerce, etc.

The steel industry has always held a position of significant importance in the context of economic development and the government's policy space. Although the industry accounts for roughly 1.04% of the country's GDP, as per the latest estimates, the Indian government has always believed that steel is the backbone of industrialization and every industrial nation starts with a strong steel industry going side by side.[3] Despite the fact that the overall importance of having steel capacity within the country has changed in time with global overcapacity and the emergence of a competitive global market, the unending volatility in global steel prices and related raw materials such as iron ore and coking coal, steel security remained a predominant policy parameter for India. The second common perception is that the industry has strong forward and backward linkages in the economy and therefore can act as a prime mover for employment and income generation especially when the economy slowly makes its transition from a lowly developing economy to an industrializing middle income economy. The third major policy stance of the government has been to ensure value addition in the natural resources the country is endowed with, such as iron ore. In addition to the competitive advantage the natural resources provide, the country could also use its low cost manpower to build up a competitive industry.

There are reasons to question, not absolutely, but in relative terms whether the government perceptions about the industry are correct or external conditions have changed to such an extent that the government views have turned irrelevant. The fact that the steel industry may not be the driving force in India either from the perspective of industrialization coupled with income or employment generation is evident from the dwindling share of the industry in the country's GDP and employment.

3
According to the estimates of the Ministry of Steel, the steel industry (or the sector) has a share of about 2% in GDP. This estimate is based on the author's own calculation from the data of Annual Survey of Industries, 2014-15.

In the past, 70,000 workers were required to produce 1.5 Mt of steel.[4] Today, a new plant will take about 3,000-4,000 employees to make 5 Mt a year. There is abundance of time series data in the Annual Survey of Industries showing the declining employment intensity in the steel industry.[5] Even in the areas of backward and forward linkages, massive automation and e-commerce have reduced employment generation potential. The steel industry, like most other capital intensive industries, will be able to survive only when their labor costs are reduced and manpower productivity is maximized.

The abundance of raw materials, such as iron ore, coal, manganese ore, etc. has become subject matters of statistics rather than real advantage to the industry in the way it is perceived. The age-old policy of steel production based on captive iron ore or coal has benefitted only the old entities like Steel Authority of India Ltd. (SAIL) and Tata Steel (erstwhile Tata Iron and Steel Company). The new generation steel producers have not been freely provided with captive iron ore mines. Even if these were allocated to them, all came to them at significant prices as the same were put to auction in most cases. In addition, both the central and state governments found it convenient to raise tax burden on mining as mining was seen to be an extremely profitable business. The royalty, local area development tax, forest development tax, and many such taxes have put a significant financial burden on the mining industry. The costs get passed on to the steel industry. The problem here is that the industry players who have grown rapidly and have demonstrated capability of growing rapidly are the ones who have a scanty advantage of India's iron ore resources. As the global prices drop and domestic prices or the costs of acquiring iron ore mines rise, the competitive advantage on account of iron ore will literally disappear. The high quality iron ore mines are either captively held or lie in the hands of merchant players. The government does not really have a clear policy on mining with a view to providing steel makers and miners with the advantage of abundance of local resources. If the efficiently-run private mines are put to re-auction in 2020 in the state of Odisha, say, the bidders will have to quote hefty numbers which will in effect neutralize the iron ore advantage other time. The government is also concerned that since mining is an environmentally challenging activity, the socio-economic or environmental costs on account of mining should directly be borne by the miners.

In recent times, prior to 2014, iron ore, coal, and several other mineral resources used to be allocated on the basis of priority and needs, and much of these allocations came under heavy scrutiny in the subsequent period. This made the government to cancel a lot of coal leases and start fresh bids. This, in expected lines, caused massive disruption in the business and raised costs of mining and delivery of minerals to end users. In addition, seeing rampant violation of environmental laws and procedures in iron ore mining, the Supreme Court of India literally took over the task of clearing the mess in the iron ore industry. The state-based quotas were imposed on Karnataka and Goa. This resulted in disruptions

4 These are figures for steel plants such as Tata Steel or those of SAIL, prior to 1980.

5 The last Annual Survey of Industries was done for 2014-15.

In the absence of domestic expertise at the highest global level and large capital to fund big steel projects, the government liberalized the foreign investment regime and accorded all supports to such proposals.

in the supply of iron ore and the steel industry had to bear the cost. Today, as it stands for both iron ore and coal, much of the money invested by the industry remains stuck in legal battles and procedural complications. The commonly-applied government policy of auctioning out mines raised the costs for steel makers.

In the absence of domestic expertise at the highest global level and large capital to fund big steel projects, the government liberalized the foreign investment regime and accorded all supports to such proposals. However, several cases of foreign investment in India turned out to be unsuccessful. The overall FDI in iron and steel, despite seemingly strong intent of the government, remained very low or rather negligible.[6]

The government and various agencies under its control seemed to have consistently built up cases for investment in new steel capacity. For that, it created a perception that steel demand in the country would grow to high levels, as documented in the National Steel Policy 2017 and more so in the earlier versions of the same drafts of which were prepared since 2011 or so. While this attracted a lot of foreign interests in investment in the industry, much of this has now ended up in smaller standalone steel plants.

The broader question raised above points to certain conflicts within the economic order in the country and the lack of adequate direction towards a meaningful and consistent position. The simple fact is that steel-intensive sectors cannot afford expensive steel while cheap imports can effectively ruin the prospects of growth of the industry. At a policy level, so far, the Indian government has been proactive protecting the interest of the steel industry when it comes to competition from imports. There is a host of trade actions on a very wide range of steel products apart from a number of policy actions, a few withdrawn now, which build non-tariff barriers for Indian steel. At the same time, the government is making best efforts to raise bilateral trade with other countries with strong steel industry lowering tariffs and giving a better access to foreign steel in the domestic market. For

6 Report of the Reserve Bank of India, 2017

example, the country has signed free trade agreements with both Japan and Korea and as a result the import duty rates for these countries have been reduced to zero for a large number of steel products. The fact that foreign or even domestic investments in critical product areas are coming as standalone businesses depending on imported steel intermediates, a protectionist policy may slow down such investments in critical product areas. For example, the country's efforts to develop electrical steel grades (CRGO), certain auto grade CR coils/sheets, and high-end stainless steel products have met with complications since high import duties or other trade restriction policies in respect of their immediate raw materials are making economics of these efforts going haywire. The steel-using industries have taken the hit.

Table 2. Steel Export and Import in India (in 000 T)

	Import		Export	
	Finished	Semi Finished	Finished	Semi Finished
2001 - 02	1373	-	2709	-
2002 - 03	1663	-	4517	-
2003 - 04	1753	-	5207	-
2004 - 05	2293	-	4705	-
2005 - 06	4305	372	4801	388
2006 - 07	4927	281	5242	665
2007 - 08	7029	166	5077	373
2008 - 09	5839	500	4437	746
2009 - 10	7382	347	3251	625
2010 - 11	6664	245	3637	350
2011 - 12	6862	529	4587	202
2012 - 13	7925	549	5368	144
2013 - 14	5450	50	5985	486
2014 - 15	9320	366	5596	443
2015 - 16	11712	981	4079	639
2016 - 17	7227	732	8243	1066

Source: Joint Plant Committee

Steel industry performance: a critical analysis

The question now is, despite all the attention provided and potential witnessed, why has the steel industry failed to live up to the expectation?

Although steel production in India dates back to the early decades of the twentieth century, the overall development of the industry could not keep pace as the industry remained under strict control which did not allow free private investment and controlled both pricing and distribution of steel. It was only in 1991-92 that the policy regime was open to support the private sector investments in the industry. The private sector entered late with very little experience of project or financial management. Poor planning, high costs of projects arising out of many factors including mismanagement of funds and cyclical movements in the steel industry fortunes led to significant disruption in the business of the steel industry. This was so especially for new entrants from the private sector. It took many years for the projects to complete and it was only with the support of the benevolent banks and financial institutions that the new private players could head back into the business. While the next phase of private investment saw the emergence of large companies, the Jindal Group (companies such as JVSL/JSW, JSPL, Jindal Stainless, etc.), Essar Steel, Ispat Industries (later taken over by JSW), and Bhushan Steel Ltd (Bhushan Power and Steel Ltd.), some of them were credited with the praise of being world class players, and the woes

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of the industry remained pretty much of concern even on date as projects failures remained abundant and the ability of the industry to handle or even foresee externalities were proved to be inadequate. In the meanwhile, the older entities, Tata Steel Ltd., expanded their capacity from less than 2 Mt in 1991 to 10 Mt at the original location, Jamshedpur, and set up another 3-Mt plant in Kalinga Nagar in Odisha. The quickly found opportunities also brought in small players with largely owned capital into the picture. Steel, mostly in construction grade, started being made using induction furnaces. Their unofficially known estimates of capacity of crude steelmaking stood at about 45 Mt at its peak.[7] They were supported by integrated or standalone small and medium rolling mills producing long products, such as rebars and light and medium structural. The mushroom growth of smaller plants, however, came as a big hindrance to the viability of large plants planning long products. This showed clearly that the industry growth was haphazard and was meant to purely address short-term requirement of a rapidly growing economy.

The developments in the steel industry since the 1990s have not been much different from other industrial sectors in comparable sizes. Although much of the project management was overseen by established foreign companies as technology and equipment were taken from abroad, the local issues such as land acquisition, forest clearance, manpower management, getting raw materials linkages, etc. were all beyond the scope of technology management. What one saw across the manufacturing sector was a lack of proper planning before projects were rolled out. Also, each private group had their hands filled with multiple projects in widely diverse areas. For example, a group like Essar Group had petroleum refining, petrochemicals, construction, IT, and mobile telephony in their hands, to name a few. Each major group was chasing the capital market with projects which had not perhaps gone through the necessary due diligence. Failures were bound to come and the steel projects came to be

7 Estimates of the Economic Research Unit, based on occasional discussions with the industry and the makers of induction furnaces.

The steel industry in India faces certain deep structural flaws. The industry is built around a widely diverse technology mix with co-existence of both very small, medium and large integrated works with high degree of vertical disintegration.

the prominent casualties when the time turned bad. Failures in project management in the public sector were far more serious. Even the simple brownfield expansion projects in SAIL in the mid-80s to the early 90s and the recent investments in both SAIL and RINL are examples to indicate structural and intrinsic deficiencies in the system that one needs to worry about when it comes to building steel plants in India today or in the future. Every failure slowed down the realization of the potential seen and put the industry's competitiveness another step behind the world competition.

While project management and financial woes were prominent, the Indian steel industry also has so far failed to reach global best practices in operational efficiency parameters, barring a few exceptions in the private sector. The raw materials and energy consumption have been much higher than the best known results, as shown in the New Steel Policy 2017.[8] Interestingly on most major parameters, the targets set for 2030-31 are worse than the current global best benchmarks.[9] The manpower productivity has been equally low and the low labour cost advantage that is often talked about is slowly fading away. While product development efforts of the major private sector players have been credible, the government-owned producers are standing way behind. Being stuck with low-end of the value addition chain, these producers' average revenue remains suppressed, leading to their weakening finances. Most of the time, lack of investment and facilities are cited as excuses for low quality and low-end products. The ground reality does not support this point of view. The problem is that the assets created in the government owned companies are of low quality, despite being brought in at high cost.

Lack of sufficient product development efforts, especially in the areas of steel application to provide sufficient solutions to end users to make choice of steel as competitive vis-a-vis other products will have a long term impact on the industry's viability as the user industries will look for ready-made solutions which may be available from overseas competitors. The steel industry will have to provide a complete package to high-end consumers. It is already evident, as the steel-using industries, including major government-owned infrastructure and energy busi-

8 New Steel Policy 2017, Ministry of Steel, www.steel.nic.in

9 Ibid

Table 3. Share of Private Sector in Domestic Crude Steel Production

Year	Share of private sector in total production (%)
1992-93	37.2%
2000-01	49.1%
2016-17	81.1%

Source: Joint Plant Committee

Table 4. Indian Crude Steel Production by Process Route

Process route	2005-06	2016-17
Basic oxygen furnace	53%	43.1%
Electric arc furnace (EAF)	18%	29.5%
Induction furnace (IF)	29%	27.4%
Total	100%	100.0%

Source: Joint Plant Committee

nesses, such as railways, petroleum industries, favor imports, despite being forced to pay more for imported products.

The structure of the Indian steel industry

The steel industry in India faces certain deep structural flaws. The industry is built around a widely diverse technology mix with co-existence of both very small, medium and large integrated works with high degree of vertical disintegration. Further, with both the public and private producers present, the ownership pattern and the style of management remained fairly complex. The entire system exhibits high degree of conflicts with multiple industry identities trying to survive or gain from government policies on matters starting from raw materials to external trade. The lack of uniformity has actually led to high system costs instead of reducing the same as excess capacity exists more than warranted in various segments.

The ownership of integrated plants lie both with the government-owned or private companies. However, other plants are almost entirely in the private secotr. During 2016-17, the private sector accounted for 81% of total crude steel production while the public sector accounted for 19%.

In terms of choice of technology, production through oxygen route remains the dominant steelmaking technology in the country with a share of 43.1%. Interestingly, and largely on account of the abundance of iron ore and sponge iron capacities, electric steelmaking route flourished with induction furnaces accounting for 27.4% of total crude steel production with the electric arc furnaces making for another 29.5%.

Recent trends in steel production and consumption in India

For the domestic steel industry, the year 2002-07 was a period of rapid growth with significant increases in both production and consumption of steel. However, with the onset of the global economic downturn, the same pace could not be maintained in 2008-09. Like all other manufacturing industries, steelmaking is also largely market-driven and, therefore, was affected directly by the adverse global market conditions. Fortunately, the sector was able to contain the rate of decel-

eration thanks to the timely policy interventions and counter-cyclical stimulus of fiscal and monetary packages brought in by the government. Also the inner stability of the Indian economic system helped to better overcome the crisis. The Indian steel industry recovered in next two years with double-digit growth rates.

However, beginning 2011-12, a combination of global and domestic factors such as economic slowdown in the West, demand deficits once again led to slowdown in steel consumption. The country's external trade balance in steel fluctuated over the period mainly depending on the global market conditions.

Financial status of the Indian steel industry

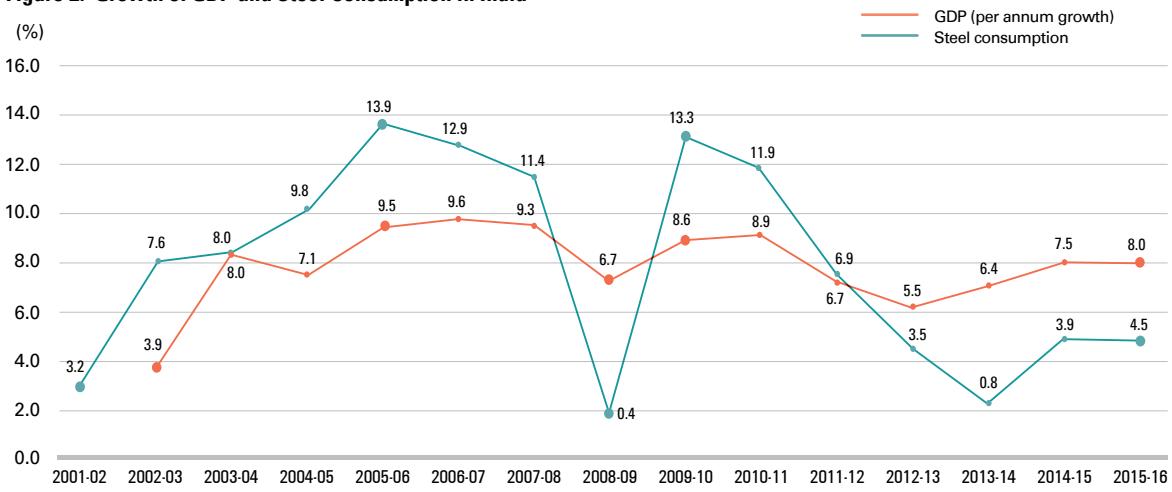
A risk profile of select industries at the end of March 2017, as carried out by the Reserve Bank of India, showed that the steel industry continues to suffer from the high leverage and interest burden. The industry accounts for nearly 22% of the total debt considered under restructuring, coming second to only infrastructure sector. The situation was worse a year ago. Although a host of trade actions to protect the industry from foreign competition and the rising global steel prices have brought back some stability to the balance sheets of the industry in general, the situation in respect of the government-owned companies has remained critical. Given the history of the steel industry, the probability of a price fall any time in the future cannot be ruled out. This means, at any such time, the Indian steel producers may be heading back to another similar crisis. The difficulty is, if the industry is in perpetual debt or its finances are relatively or absolutely weak, it will be hugely challenging to gain confidence of investors, particularly of the banks and the financial institutions.

The reason why the Indian steel industry has such an inconsistent growth, proving most industry analysts and investors wrong, needs to be examined more carefully despite the fact that much of the scenario is visible to all. Many such observations and developments in this context are quite similar to those worldwide. The steel industry, the respective national governments, and the financial institutions behaved consistently and in tandem to create a strengthened euphoria about the steel industry prospects everywhere to drive up the investments in the industry and create a much larger and wider production capacity. In a different context when overinvestments become apparent with demand falling or growing way below expectation, the industry comes back to the financial institutions for help and the respective national governments for protection. Interestingly, many of these cyclical developments are continued to be seen as outcomes of intersecting market forces. The time has perhaps changed. The basic question today is what drives steel prices and what makes people to invest in steel.

Indian steel market prospects

Steel consumption has a strong relationship with GDP, manufacturing sector, gross capital formation (investment), and especially construction. However, the relationship between GDP and steel consumption has undergone some changes. GDP

Figure 2. Growth of GDP and Steel Consumption in India



Source: Joint Plant Committee and Ministry of Statistics and Programme Implementation

elasticity of steel consumption in India has fallen from about 1.2 about 20 years ago to less than one currently.[10] This is because of the nature of consumption, rising share of the services sector, and IT products occupying a large space in the country's GDP.

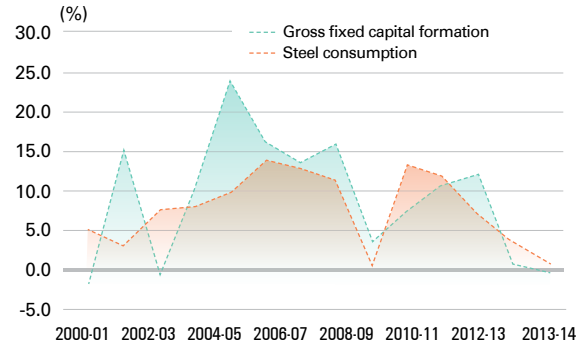
While there is no major deviation foreseen in the overall growth path of steel consumption in India through 2030-31 from those indicated by the government in the formulation of the new steel policy, consumption pattern may undergo some major changes towards the end of the period due to differential growth in the end-using sectors, technological changes reducing the intensity of steel use in the existing applications, and substitution impact from competing products.

The other most important factor that would impact the steel consumption patterns is the higher supply costs of steel on account of more stringent environmental consideration. If steel becomes a more expensive material, its demand will be hit by alternatives available fulfilling similar criteria. Whereas the Ministry of Steel and steel makers are busy advocating the goodness of steel considering its long-term life cycle costs and benefits, and its recyclability, the shortages of capital for investment have led investors to look for least cost alternatives. In many areas, steel has been displaced by plastics, say, for example. There are not much options available. However, the pure price effect may limit steel use to the minimum levels for which new lower weight and stronger products will have to come in.

In infrastructure, despite strong intents, a sheer backlog of work that remains to be done hurriedly, railways, for example, will not be able to grow significantly in the decades to come due to fund shortages, most importantly. Network decongestion, safety improvement, station development,

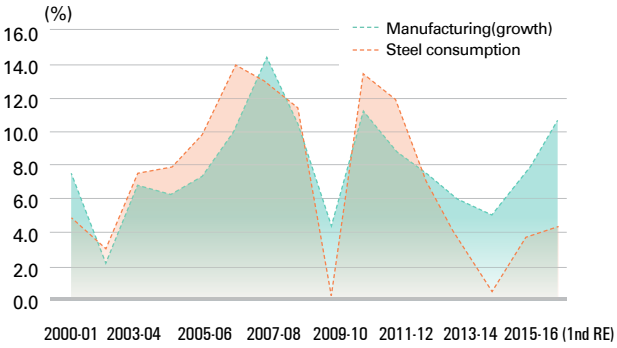
10 Estimates of the Economic Research Unit

Figure 3. Growth of Gross Capital Formation and Steel Consumption



Source: Joint Plant Committee

Figure 4. Growth of Manufacturing and Steel Consumption



Source: Joint Plant Committee

and logistics will take away a lot more money than network expansion.[11] The expansion of network to accommodate high speed trains will not help Indian steel producers immediately as the required track materials will all be imported through global tenders as domestic producers have not so far established their technical capabilities.

While the government-aided and -initiated projects are in course, the private sector investment in infrastructure has not grown. Therefore, the bulk of the infrastructure-elated steel demand will come from the government only.

The passenger car segment has been on a high growth path currently. However, this industry faces cyclical downturns. The longer term prospects of steel use in the industry will be impacted negatively by popularization of electric and smaller vehicles.

There are no reliable studies on the end-use steel consumption pattern in India. Based on studies carried out by various expert agencies like CRISIL, ERU, worldsteel etc. and moderation undertaken by the author, the broad pattern can be seen in Table 5.

From the current visibility, the prospects of the major steel-intensive industries are shown in Table 6. [12]

Most studies carried out by the Economic Research Unit show clearly that the country will see gradual growth in the share of flat products in

Table 5. Current End-Use Based Steel Consumption Estimates (2015-16 & 2016-17 Average)

Sector/Industry	% of Total Steel Consumption
Construction including infrastructure	59.0
Automobiles	8.8
Capital Goods and Machinery	14.1
Packaging and Containers	1.1
Appliances	3.0
Others	13.4
Shipbuilding	0.6
Breakup of Construction and Infrastructure	
a) Housing	23.6
b) Industrial Construction	17.7
c) Infrastructure	17.7
d) Railways	2.7

11 Ministry of Railways documents and Morgan Stanley Research, January 8, 2016

12 Author's own study and perceptions based on existing visibility, reports of expert agencies etc.

Table 6. Steel Intensive Sectoral Growth Prospects

	Sector/Industry	2018-20	2021-23	2024-26	2027-29	2029-31
1	Passenger Cars	Moderate (5-7%)	Moderate (5-7%)	Weak (3-4%)	Moderate to Strong (6-8-%)	Moderate to Strong (6-10%)
2	Commercial Vehicles	Weak (3-4%)	Moderate (5-6%)	Moderate to Strong (6-10%)	Moderate (6%)	Weak (3-4%)
3	Capital Goods and Machinery	Moderate (4-6%)	Moderate to Strong (6-10%)	Moderate (4-6%)	Moderate (4-6%)	Weak to Moderate (3-4%)
4	Residential Housing	Very Weak (1-2%)	Very Weak (1-2%)	Weak to Moderate (4-6%)	Weak to Moderate (4-6%)	Weak to Moderate (4-6%)
5	Commercial Housing	Very Weak (1-2%)	Very Weak (1-2%)	Weak to Moderate (4-6%)	Moderate to Strong (6-10%)	Moderate to Strong (6-10%)
6	Railways (Tracks and Rolling stock)	Very Weak (1-2%)	Moderate (5-6%)	Moderate (6%)	Moderate (6%)	Moderate (6%)
7	Roads and Bridges	Very Strong (10-12%)	Strong (10%)	Moderate (6%)	Weak to Moderate (3-6%)	Moderate (6%)
8	Urban Infrastructure	Moderate to Strong (6-10%)	Moderate(6%)	Moderate (6%)	Moderate to Strong (6-10%)	Moderate to Strong (6-10%)
9	Industrial Construction	Weak (4-5%)	Moderate to Strong (6-10%)	Moderate to Strong (6-10%)	Weak (4-5%)	Weak (1-2%)
10	Steel Intensive Consumer Durables and Appliance	Weak to Moderate (4-5%)	Moderate to Strong (6-8%)	Moderate to Strong (6-8%)	Moderate (4-5%)	Weak (1-2%)
11	Ports / Airports	Moderate (4-5%)	Moderate to Strong (6-10%)	Moderate to Strong (6-10%)	Moderate (5-6%)	Weak (1-2%)

the overall consumption. However, even untill as late as 2030-31, long products will have an overwhelming share of 55%.

The Indian steel industry's growth should be seen largely in potentials for domestic market expansion. The projected 225 Mt of domestic steel consumption by 2030-31 is based on the assumption that infrastructure and housing sectors will maintain strong growth, leading to rising demand for steel, general and long products in particular. The railways can be the main driver of growth. But, finance will come into the play as the railways are fraught with shortfalls all around. For new tracks, they will have to depend on imported steel as the domestic products are unlikely to be ready by that time.

Within the manufacturing sector, currently, the automobiles industry, especially the passenger car segment has been growing strongly. However, one will have to see whether the car demand from the taxi segment will continue at the same pace along with the privately-owned segment, as the taxi segment growth may end up replacing the private ownership segment.

Strategic issues and concluding remarks

A question arises in the global business context. Is it necessary that India produces all the steel that it requires and that the industry prepares the ground to be a large player in the global market? The question is to be seen in the context of intrinsic competitiveness in steel production, ability to garner sufficient domestic and global money for investment, winning competition from potential steel industry overseas, and competing other in-

The steel industry has to move away from the volume business to entities for value creation to keep steel a material of first choice when it comes to competition from alternative products. Inability to develop new products will mean increased competition from imports.

dustries and businesses locally.

Are there necessary signals to support that the steel industry will be able to generate and draw sufficient investment resources to raise the production capacity to the expected levels? Further, going by the project implementation records of several producers, including those in the public sector, the steel producers are unlikely to figure in the good books of the capital market and financial institutions. Therefore, even if there is demand, the current lot of steel makers, barring a couple of exceptions, will not be able to generate sufficient resources to add the required steelmaking capacities and develop the related infrastructure and raw materials base. The resources, like land and captive raw materials held by the companies like SAIL, can be leveraged to add brownfield steel plants. But, a viable business model is still hard to find.

Indian steel producers who were late entrants, in the global context, failed to compete with far superior players overseas. One of the reasons for the failures on the part of the larger private players was some kind of overconfidence which led them to start the project way earlier than even regulatory clearances were in place, land was made available, infrastructure necessary was built, or the raw materials sourcing were firmed up. The maddening hurry witnessed wand due to the fact that there was strong competition within the country itself for financial resources. The industry, in many parts, also took to low cost easy alternatives such as production of steel through induction furnaces, use of coal-based DRI plants and small merchant rolling mills. In terms of resource use, most of them are inefficient and polluting. Many survived not because of their competitive positioning in the market but because they could take advantage of the loose taxation system. These units engaged largely in the production of long products have survived, also because of their proximity to the market in the far-flung areas of the country. The large integrated mills can find a significant market with the potential demise of the smaller unviable entities. Most of the existing plants will give way to larger plants with techno-

13 Author's own unpublished study in progress

Source: worldsteel

logical sophistication to meet the quality demand of the end-using industries. If large integrated plants are difficult to set up, new investments are likely to be in the plants with crude steel capacity of about 1.5 Mt.

This will also shift the positioning of raw materials in the future growth of the industry. The world will consume more steel and over time more and more scrap will be generated which will invariably be recycled. This means, the steel industry will see the importance of both iron ore and coking coal dropping over the coming decades. In another 60 years, the world is likely to have enough scrap generated to meet about 70% of the global steel demand.[13] This assumes that by that time, even the developing nations will have reached their peaks in annual steel consumption. This will further take away the advantages of India's iron ore resources and also challenge the competitive positioning of large BF-based steel production in the country. It is time that India takes note of it.

Strong sensitivities in respect of environmental degradation and pollution will make steel producers to spend a lot more money to set up fresh capacity. It will make more sense if the steel industry can make use of this capital intensity to produce high quality products and educate the steel-using industries how best to minimize steel use with better design and application. The steel industry has to move away from the volume business to entities for value creation to keep steel a material of first choice when it comes to competition from alternative products. Inability to develop new products will mean increased competition from imports.

The Indian steel industry in particular will have to realize that steel prices are no longer exclusively determined by demand and supply forces in the market. Much of the direction is shaped by speculative and manipulative actions of various agents in the economy which may, in fact, include many unscrupulous steel industry players, too. The Indian steel industry is at the initial growth stage and may find it hard to absorb the impact of such wrong and misguided market signals.

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Restructuring Scenario of the Indian Steel Industry to Enhance Its Global Competitiveness

In January 2017, the Indian government publicly released its "National Steel Policy (NSP) 2017," which declares the aim of increasing steel production capacity from 122 Mt in 2015 to 300 Mt in 2030 in order to attain self-sufficiency. To achieve this goal, this article examines various issues from raw materials to utilities, infrastructure, technology, environment, safety, and finance to suggest the directions to go.

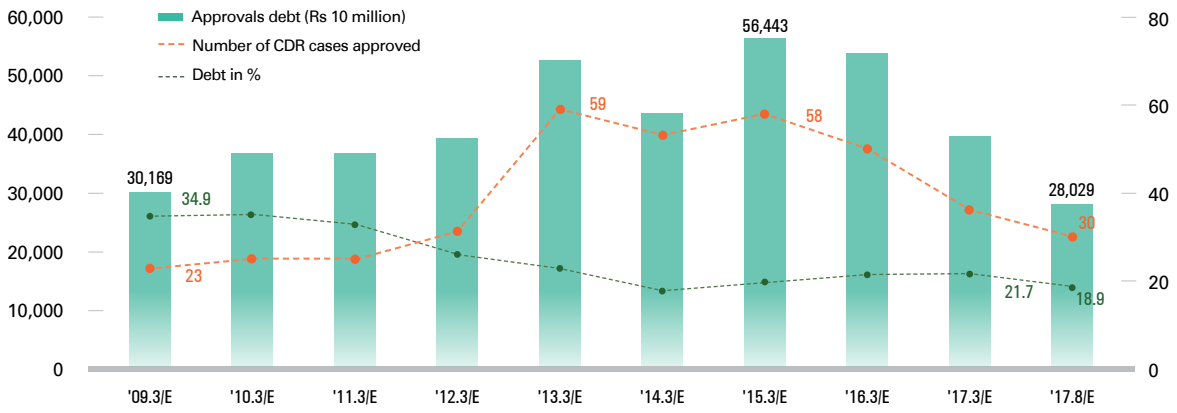
However, the insolvency issue recently looming large in the Indian steel industry makes this goal appear somewhat hollow. India is estimated to require an investment of INR 10 trillion to increase its steel capacity to 300 Mt by 2030. However, neither the steel sector nor even the financial sector could afford this. As of March 2016, the Indian steel industry's debt surpassed INR 3 trillion, and between INR 1.15 to 2 trillion within it is categorized as non-performing assets.

India's Ministry of Steel has presented an array of half-baked ideas for encouraging investment in steel capacity expansion, but it is actually time to assess and then address the roots of the insolvency issue. The restructuring issue should not remain unresolved following a temporary market recovery, as happened in the past. In order to avoid a repetition of this mistake, this article identifies the causes of the severe insolvency challenge facing the Indian steel industry, considers scenarios for its restructuring, and makes several necommendations for raising its global competitiveness.

Insolvency in the Indian steel industry

Insolvency seems nothing new in the Indian steel industry. In late March 2009, 23 steel companies with total debts of nearly INR 302 billion were approved for the Scheme for Corporate Debt Restructuring (CDR). Steel made up the largest proportion of the industry among the entities approved, comprising 34.9% of the total. The number of companies approved and the amount of debt increased to reach 58 companies and INR 564 billion in late March 2015. These figures fell significantly after late 2016, but the steel indus-

Figure 1. Number of Cases Approved by CDR Cell, Aggregate Debt, and Debt in %



Source: India CDR Cell (http://www.cdrindia.org)

try still remained as the largest segment in the program, with 30 companies approved and INR 280 billion of debts as of late August 2017.

As the infrastructure industry followed the steel industry into the heavy burden of debt, the Reserve Bank of India (RBI) began intensively managing non-performing assets in 2014. In addition, a long-delayed legislative framework, the Insolvency and Bankruptcy Code (IBC), was formalized in 2016. Following the legislation of the IBC, the National Company Law Appellate Tribunal (NCLAT), a quasi-judicial body, was established to manage bankruptcy and recasting proceedings in a timely manner on behalf of ailing companies.

In June 2017, the RBI listed 12 large accounts to be urgently referred for resolution under the IBC. With more than 60% of their assets classified as non-performing, they represented about 25% of current non-performing assets (estimated at approximately INR 8 billion) in the banking system. Among the 12 defaulters were five medium- and large-sized steel companies: Essar Steel, Bhushan Steel, Bhushan Power and Steel Limited (BPSL), Monnet Ispat, and Electrosteel. In addition to being found on this list, they share another thing in common: they had all pursued active investment including building integrated steel mills. In late August, 2017 the RBI sent a second list of underperforming companies to lenders recommending that the identified firms shall be referred for resolution via a corporate restructuring system, or otherwise they shall be taken before the NCLAT by December 2018. The second list is presumed to include four steel companies: Visa Steel (an alloy manufacturer), Uttam Galva Steels (a cold-rolled, galvanized, and color coated steel producer), Uttam Galva Metallics (a pig iron producer), and Asian Colour Coated Ispat (a cold-rolled, galvanized, and color coated steel producer). A contributor to their distress is also imprudent investment in facilities.

Table 1. Steelmakers Subject to Insolvency Bankruptcy Code CIBC as Listed by the Reserve Bank of India (Rs 10 million, Mt)

Type	Company	Debt	Plant location	Capacity	Major products
Major Producer	Essar Steel	29,488	Gujarat	10.0	HR, plate, CR, GI
Secondary Sector	Bhushan Steel	42,356	Odisha	5.6	HR, CR, GI
	Bhushan Power & Steel Limited	37,248	Odisha	3.5	Bar, wire rod, HR, CR
	Monnet Ispat & Energy	10,333	Chhattisgarh	1.5	Sponge iron, bar, plate
	Electrosteel Steels	7,505	Jharkhand	2.5	Billet, bar, wire rod, pipe

Source: Company websites and Firstpost (retrieved June 17, 2017)

Despite the efforts of the IBC and NCLAT, insolvency could not be rapidly addressed for a number of issues. The IBC has a moratorium period of up to 270 days. As a newly introduced bill, the IBC must make trials and errors. Objections from the related companies and lawsuits can also delay the process. Furthermore, recent economic conditions have not been contributing positively. India's GDP growth stood at 5.7% in April-June of 2017-18, the lowest figure under the Modi administration. Although the decline is due to a temporary shock caused by demonetization and the introduction of a Goods and Services Tax (GST), several institutions both at home and abroad have lowered India's GDP growth outlook. Domestic steel demand remained sluggish. Steel demand was up only 4.4% for April-August 2017 compared to a year earlier, indicating no outright recovery.

Causes of insolvency

After major steel companies such as SAIL (Steel Authority of India, Ltd) and JSW Steel mostly ran deficits in 2015, the Indian steel industry strongly protested to the Indian government while blaming massive Chinese import inflows for a price plunge. In response, the government enacted an array of trade remedies, including safeguards, a Minimum Import Price (MIP), and anti-dumping duties. As a result, steel imports that had increased from 5.7Mt in 2013 to 10.0 Mt in 2014 and then to 12.7 Mt in 2015 fell to 7.4 Mt in 2016. Steel companies' performance improved, and JSW returned to a surplus. However, steel imports are not the only culprit in the insolvency of the Indian steel industry. As stated earlier, the number of Cases approved by CDR Cell and the amount of debt was already high in 2008. Steel companies were unable to repay even the interest on their debt once demand growth slowed to 2-4% and steel prices declined. Moreover, India's average lending rate was relatively high compared to other countries in 2015 at 12%. In contrast, the rate stood at 1.2% for Japan, 3.7% for Korea, and 5.6% for China.

Figure 2. India's Actual Steel Use and Growth Rate

Source: Joint Plant Committee

However, there are other fundamental reasons underlying the insolvency. The first relates to policies based on the ripple effect from the NSP 2005. Formulated by the Indian Ministry of Steel and approved by both the Lok Sabha (House of the People) and Rajya Sabha (Council of States), the first National Steel Policy estimated that India would require the steel production of 110 Mt by 2020 to satisfy rising steel demand. The Indian government actively encouraged investment to increase steel production, which stood at only 38 Mt in 2004 and even allocated captive mines. With a high economic growth rate of about 8-9% sustained over five years from 2003, the government, the industry, and the financial sector were all confident that it would only be a matter of time before double-digit growth like China's was attained. Steel companies scrambled to make investments, and banks, especially state-owned banks, readily lent funds to the highly lucrative steel industry as it strove to meet the demands of government policies.

In addition, it seems that POSCO's entry into India provided a trigger event. In June 2005, POSCO, the world's fourth-largest and the world's most competitive steelmaker according to World Steel Dynamics, signed a memorandum of understanding (MOU) with the Odisha state government for an integrated steel mill (ISM) with a capacity of 12 Mt and a captive iron ore mine with 600 Mt of reserves. The Indian steel industry appeared to perceive POSCO's entry both as a threat and a prompt to enter the fast-growing sector. India's definitive steel company, Tata Steel, and the world's largest steel company, ArcelorMittal, followed suit in order to build ISMs, triggering a rush to sign MOUs.

Up to 2010, four states with rich iron ore reserves, including Odisha and Jharkhand, signed a whopping 222 MOUs for a combined proposed production capacity of 283 Mt. Most of the MOUs failed for several reasons: difficulty in obtaining land acquisition and mineral concessions; administrative complications, such as environmental approval; and lack of execution ability on the part of the involved companies. Ironically, ailing steel

Table 2. Financial Performance of Three Major Indian Steelmakers (Consolidated Basis)

Company	Current net income (Rs 10 million)		Total debt (Rs 10 million)		Debt ratio	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Tata Steel	– 497	– 4,169	132,998	133,622	299%	339%
JSW Steel	– 501	3,454	63,694	65,639	339%	293%
Jindal Steel & Power	– 3,086	– 2,540	59,062	59,901	177%	195%

Source: Website of each company

companies currently castigated for bad loans such as Bhushan Steel and BPSL were actually successful in these challenging greenfield projects.

When greenfield investment failed, steel companies began focusing on the expansion of existing steel plants. India's three largest private steelmakers, Tata, Essar, and JSW, made competitive brownfield investments, as if they were racing to be the first to secure a 10-Mt capacity. Moreover, JSW spent INR 22 billion to acquire Ispat Industries in 2010.

The second cause of insolvency is the impact of ArcelorMittal. The company is known for its business model of acquiring ailing companies and successfully converting them into the world's largest steel company within only a decade. This caused India's private steelmakers to turn their eyes overseas. Coincidently, they were able to raise funds from abroad at low interest rate due to a relaxation of foreign currency policies. In 2007, Tata acquired the large West European enterprise ISM Corus for USD 12 billion, and Essar bought Canada's ISM Algoma for USD 1.63 billion. Inspired by Mittal's backward integration model, they set out to secure overseas raw materials and began investing in South America, Canada, Africa, and Australia. These active investments at home and abroad left debts that were massive even for large steel companies. This investment fervor among Indian steelmakers, regardless of their size, was suspended after two rounds of financial crises, but left huge effermath within the industry.

Restructuring direction of the Indian steel industry

It seems a simple matter to predict the direction of restructuring in the Indian steel industry. The overall industry is suffering from financial distress, but only Tata and JSW appear to have the ability to borrow money from banks and maintain stakeholder trust. Although these two companies certainly hold massive debts, given that they have the least probability of pursing bankruptcy they could increase their market domi-

These active investments at home and abroad left debts that were massive even for large steel companies. This investment fervor among Indian steelmakers, regardless of their size, was suspended after two rounds of financial crises, but left huge effermath within the industry.

nance through M&As or investment in building or expanding facilities. State-owned steelmakers such as SAIL and RINL (Rashtriya Ispat Nigam Ltd) have no room to acquire distressed private steelmakers since they must complete their own facility investment plans.

JSW Chairman Sajjan Jindal has been leading the integration of the Indian steel industry through strong initiatives. He increased JSW's production capacity from 1.6 Mt in 2002 to 18 Mt in 2017. In addition to expanding its Vijayanagar steelworks, JSW has acquired SISCOL (1.0 Mt) and Ispat Industries (3.3 Mt). Since he already has experience with acquiring and turning around underperforming companies, he might be thinking hard about which steel company to buy, and how to enhance synergy and make profits without undermining the financial soundness of his entire group. He has recently shown an interest in acquiring Bhushan Steel and Monnet Ispat with their iron ore mines in the Odisha state. Mr. Sajjan has a vision of increasing his company's production capacity to 45 Mt by 2030; therefore, he could buy underperforming companies at any time funds are available.

In September 2017, Tata Steel signed a MOU to merge its Tata Steel Europe unit with Thyssenkrupp's Steel Europe. The 50:50 joint venture is scheduled to be completed in 2019. Tata Steel will focus on India instead. It is now looking to stabilize the operations of the first phase of Kalinganagar steelworks (3 Mt) in Odisha, and is preparing to invest in the second phase (3-5 Mt). It has insufficient financial flexibility until 2020, and might tend toward prudence in new investments following the trauma of the acquisition of Corus. As it already has captive iron ore and coal mines and specializes in high-quality and highvalue-added steel products, it might be difficult for it to find a distressed company that fits with its strategy. Tata is presently half-willingly examining the purchase of Essar Steel. Essar has the advantage of being located in a coastal region that provides a gateway to the western Indian market. However, the likelihood of its acquisition is slim since the scale of the acquisition would be huge and nobody

Now is the right time for the Indian government to seek not only quantitative growth, but also qualitative improvement to enhance the global competitiveness of the domestic steel industry.

is certain how large its hidden non-performing assets could be.

Meanwhile, despite being fully self-sufficient in sourcing iron ore, state-owned SAIL posted net losses for nine consecutive quarters up to 1Q'17 due to sluggish domestic demand and rising coking coal import prices. To make matters worse, its delayed capacity expansion plan is increasing investment costs. The project, which began in 2006, was supposed to be completed by 2010, but continued into 2016. The amount of investment originally planned was INR 540 billion, but a total of INR 646 billion had been expended by December 2016 and an additional INR 35 billion will be invested further. Although it is a mega-project that expands the total capacity of five steel mills and three subsidiaries of SAIL from 12.8 Mt to 21.4 Mt, it exemplifies the inefficiency of India's state-owned companies. The second-largest state-owned integrated steel mill, RINL, is also attempting to increase its crude steel capacity, in this case from 3 to 6.3 Mt, but this plan has similarly been delayed for years. Under these circumstances, Steel Secretary C. B. Singh made clear in September that there would be no fresh investment until the SAIL and RINL projects are compete and returning profits.

The National Mineral Development Corporation (NMDC), a state-owned iron ore mining enterprise, plans to sell nearly a 50% stake in its new Chhattisgarh steelworks as it prepares to begin production at the 3-Mt facility late this year. However, no domestic or overseas company would step forward to buy it. The NMDC was already searching for a strategic investor while breaking ground for this plant, but to no avail. It is not an attractive offer on several grounds: poor location (in a jungle region with the presence of communist rebels), and objections by union, local people, and the state government. Without experience in operating a steel plant, it is questionable whether the NMDC will be able to manage the plant on its own and sell hot-rolled steel in a sluggish domestic market. Acquisition by RINL or SAIL is probably the only reasonable solution, but many stumbling blocks lie ahead with multiple complex political issues involved. The NMDC's new integrated steel mill is also the outcome of a failed policy. The NMDC has inevitably conducted this project in order to get mineral concessions because only companies that add values to iron ore could be granted mineral concessions under the rule changes brought about by the NSP 2005.

Suggestions for the Indian steel industry

The Indian steel industry has been growing significantly in terms of production over the last de-

cade. According to worldsteel, its crude steel output nearly tripled from 32.6 Mt in 2004 to 95.6 Mt in 2016. India's global ranking also jumped from ninth to third. In 2018, India will be poised to dislodge Japan and become the world's second largest steelmaking country. Therefore, now is the right time for the Indian government to seek not only quantitative growth, but also qualitative improvement to enhance the global competitiveness of the domestic steel industry. While remaining protected under anti-dumping duties until August 2021, the Indian steel industry should continue with the restructuring efforts.

However, recent remarks by the Steel Secretary and Deputy Secretary seem unrealistic, focusing excessively on the 300 Mt goal. Examples include the various measures for expanding the capacities of MSME (Micro and Small, Medium Enterprises) and the secondary sector (private steelmakers excluding major companies such as Tata, JSW, Essar, and JSPL); building five electric arc furnace (EAF) plants within a single year by scrap traders.

Instead, the Indian steel industry needs to pursue other measures to improve its global competitiveness: 1) reducing uncompetitive steelmaking processes; 2) scaling up capacity through integration; 3) granting captive mines by amending the mining laws; and 4) improving its doing-business environment.

First, India has developed the sponge iron - induction furnace – re-rolling process, which consumes less electricity and requires less investment than EAFs, and is thereby widely adopted by small and medium-sized companies. This process is advantageous because it can make use of the sponge iron easily available in India rather than relying on steel scrap imports. Induction furnace facilities began rising in both number and capacity after the mid-2000s as new ISM investments were sluggish but steel demand was rising. The number of induction furnaces surged from 650 units with a capacity of 8.5 Mt in 2003 to 1,128 units with a capacity of 38.3Mt in 2015. In addition, sponge iron production rose from 3.4 Mt in 1994 to 6.9 Mt in 2002 and to 17.3 Mt in 2015. The issue is that high quality lump ore (more expensive than iron ore fines) has been used unnecessarily for producing sponge iron and low-quality steel materials for construction. Furthermore, this coal-based sponge iron process is not free from environmental impacts. China currently has plans to dismantle small induction furnaces except for those creating high alloy steel. In this regard, India should introduce policies for

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restructuring the sponge iron industry with its the average capacity of 101,000 tonnes per unit, the induction furnace industry (34,000 tonnes per unit) heavily dependent on sponge iron, and re-rollers (31,000 tonnes per unit) supplied with sponge iron.

Second, the Indian steel industry should ensure economies of scale through integration and scaling-up in order to compete with imports into the domestic market and eventually increase exports. While the public steel sector, marred by bureaucratism and inefficiency, failed to expand capacity as planned, the private sector reacted more agilely and provided 86% of total crude steel production in 2015. However, even in the private sector, the proportion of the secondary sector is excessive, representing nearly 60% of crude steel production. Even the Joint Plant Committee in charge of statistics under the Ministry of Steel finds it hard to describe the industry accurately and can provide only estimated statistics. With their plants located near marketplaces, steel construction materials producers in the secondary sector can respond to conditions flexibly and survive in the market, but they frequently violate or evade taxation, environmental, and labor laws. The Chinese government plans to close all blast furnaces with an inner volume under 500 cubic meters and BOFs and EAFs with a tap weight of less than 45 tonnes. Similarly, the Indian government should enforce laws more strictly and crack down on illegalities in order to robustly encourage restructuring and integration in the secondary sector. Namely, it is desirable that major steelmakers produce semi-finished products and materials in proportion to the scale of their BFs and EAFs, and small and medium-size companies shift their business to the re-rolling of these materials in proximity to clients.

Third, the Indian steel industry was hit hard by mining scams in and around 2010. Because of this, India, the holder of the world's fifth-largest iron ore reserves, was forced to import 7.4 Mt of iron in 2015 and 9.5 Mt in 2015. The Modi administration has amended the mining laws to allot all mineral resources via electrical auction. In June 2016, e-auctions began for the mineral blocks, but there is only competition over the good mineral blocks. An auction system can raise prices and ultimately aggravate cost competition of the companies that succeeded in bidding. Auctions could also decrease economies of scale since companies have to buy several mineral blocks located in different areas. For example, JSW Steel won five iron ore mines scattered around Karnataka, ranging from 22 hectares up to 13,053 hectares. Furthermore, India's royalty rate for iron ore is 15%, which is much higher than that

Table 3. Upstream Status of India's Secondary Sector (2015-16)

(1,000 tonnes)

	Blast furnace (BF)	Converter (BOF)	Electric arc furnace (EAF)	Induction furnace	Sponge Iron	Re-roller
No. of units	42	3	41	1,128	303	1,378
Production capacity	18,671	3,160	15,642	38,300	30,742	42,753
Capacity/Unit	445	1,053	382	34	101	31
Output	11,546	2,222	13,352	26,796	17,322	35,035
Operation rate	61.8%	70.3%	85.4%	70.0%	56.3%	81.9%

Source: Joint Plant Committee, Annual Report 2015-16

of Brazil (2%), Australia (6.5-7.5%), or South Africa (0.5-7%).

India is losing its competitive advantage of rich iron ore reserves because of the recent decline in global iron ore prices. Given the expensive costs for mine development and land transport, iron ore imports by sea could in fact be cheaper. Therefore, the Indian government should examine the provision of India's large ISMs with captive mines in order to help them develop mines more systematically over the long term and let them provide manufactures with high-quality steel products at reasonable prices. Absent this incentive, companies would not make the massive upstream investments required, and the 300 Mt-capacity goal will become elusive. Otherwise, only low-quality products from the secondary sector will expand.

Finally, in order to secure global competitiveness, the Indian steel industry needs additional foreign investment that could provide capital and technology. The Deputy Secreaty of Steel has recently asserted that M&A would not be helpful in achieving the goal of 300 Mt capacity, so foreign investors should invest in Greenfield projects in India. However, it is a prerequisite to improve India's investment environment first. As exemplified by the stalled negotiations over a JV for an automotive steel joint venture between SAIL and ArcelorMittal, the Indian government would be better not to place excessive weight on its own interests, and proceed with projects in a more objective manner by considering global standards and the feasibility of the projects.

All in all, the Indian steel industry is required to undergo a painful but eventually fruitful restructuring, and the Indian government needs to set policy directions and guidelines to improve the global competitiveness of this field. If India continues to protect its steel industry behind high trade barriers as it has in the past, it is highly likely to become a net steel importer after 2021. Without the ability to supply high-quality steel products, India will find its 'Make in India' policy negatively impacted. The Indian steel industry is now at an important juncture and must decide: Will India keep seeking quantitative growth? Or will it also pursue qualitative growth?

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Can India Become **the Next China?**

In 2016, China's economic growth stood at 6.7%, while India's economy grew by 7.1%. With India's economic growth rate exceeding that of China, many people wonder if India can manage to become the next China. Given the profound worldwide impact of China's rapid economic growth, if India were to do the same, the global steel industry would be able to extricate itself from the stagnation it has been suffering since the financial crisis of 2008 and find a new growth engine. This article will assess whether India's steel industry could potentially follow in the footsteps of China's.

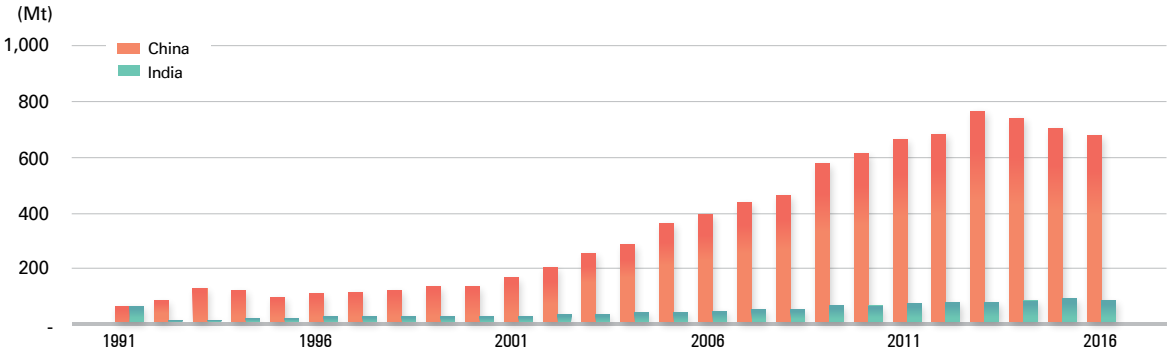
Characteristics of China's economic indicators during high steel demand years

In order to assess whether India's steel industry will be able to mimic that of China, it first requires an examination of the rapid growth trends in China's economy and steel industry, and then a comparison of the two countries. Since its reform and opening began in 1978, China has consistently achieved high GDP growth. It surpassed a compound annual growth rate (CAGR) of more than 10% from 1991 to 2010. According to the World Steel Association (worldsteel), China's apparent steel use (crude steel equivalent) increased more tham tenfold from 70 Mt in 1991 to 765 Mt in 2013.

In particular, China's steel demand surged from 138 Mt in 2001 to 612 Mt in 2010, marking a CAGR of 16.1% over these ten years. If India's steel industry is to grow to the extent of China's, it would require a repeat of what took place in the Chinese economy and steel industry from 2000 to 2010. A comparison of the two countries should be able to determine if India's steel industry can match that of China's.

First, for the ratio of gross fixed capital formation to GDP, China's increased continuously from 34.4% in 2000 to 47.6% in 2010 and then began falling after reaching a peak of 47.7% in 2011 (Figure 2). India's ratio was closing the gap with China's until it peaked in 2007 and began falling to eventually widen it. Given that India's ratio en-

Figure 1. China and India's Apparent Steel Use (Crude Steel Equivalent)



Source: Statistical Yearbook, worldsteel

tered a downward trend in 2007, it seems difficult to make another turn upward unless major social and economic shifts occur.

With regard to the contribution of secondary industry to GDP, China's rate increased from 45.5% in 2000 to a peak of 47% in 2007, but has fallen in the years since (Figure 3). India's rate peaked at 34.7%, also in 2007, and has continued to fall, but at a rate slower than that of China. The gap between the two countries still exceeds 10%p, but China has been pursuing growth centered on manufacturing and construction, while India's economic growth has been led by the service sector.

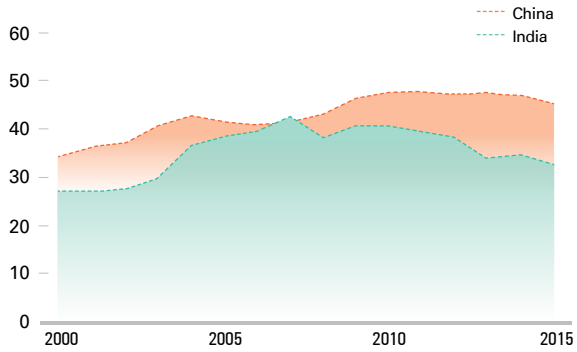
As seen in China, the proportions of gross fixed capital formation and secondary industry within GDP must increase in order for steel demand to grow profoundly. China's ratio of gross fixed capital formation to GDP rose by 13.2%p from 2000 to 2010, and the proportion of secondary industry in GDP remained over 40%, pulling up steel demand.

In addition to economic factors, there is an important social indicator to consider: the urbanization rate, which refers to the proportion of people living in urban areas within the total population. When the urbanization rate increases, it is necessary to add infrastructure, such as buildings, roads, railways, waterworks, sewerage, and bridges, to accommodate people from rural areas as they migrate to urban centers. Steel demand rises accordingly.

China's urbanization rate grew by 13.3%p from 35.9% in 2000 to 49.2% in 2010, while India's increased a mere 3.2%p, from 27.7% to 30.9% over the same period (Table 1). India's rate has continued to increase, but not as steeply as that of China, and the rate itself started out much lower than that of China.

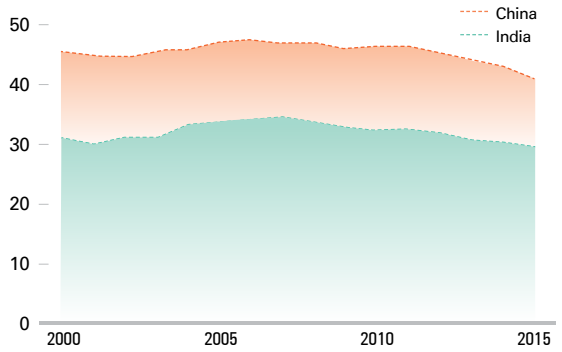
China's key indicators closely related to steel demand surged significantly between 2000 and 2010 and still remain higher than those of India. India was partially succeeding in narrowing the gap with China up until 2007, but it began to widen after that point and efforts to reverse the trend have been unsuccessful until now.

Figure 2. Gross Fixed Capital Formation (% of GDP)



Source: World Bank

Figure 3. Industry, Value Added (% of GDP)



Source: World Bank

Table 1. Urban Population (% of Total Population)

	2000	2010	2015
China	35.9	49.2	55.6
India	27.7	30.9	32.7

Source: World Bank

Economic and social characteristics in India hampering high steel demand growth

To determine why India's steel industry has been growing slower than its Chinese counterpart, it would be more helpful to consider economic and social characteristics together rather than examining economic indicators in isolation. Four years of working in Delhi from 2008 to 2011 gave me personal insight into some of the reasons why India has lower ratios of gross fixed capital formation and secondary industry to GDP than does China, as well as into why its urbanization rate lags China. Although India has been undergoing dramatic reforms since the inauguration of Prime Minister Narendra Modi in 2014, these reasons remain relevant since they are mostly structural issues within Indian society that will take considerable time to resolve.

First, strict labor laws and practices hinder the development of labor-intensive light industries in India. The Industrial Disputes Act prohibits layoffs by industrial establishments employing 100 or more workers without prior permission from the government. For this reason, Indian companies are highly reluctant to expand their number of regular employees beyond 100 and prefer instead to hire additional irregular workers to avoid this issue. As irregular workers find it relatively more difficult than do regular workers to accumulate technology skills, build a strong sense of objective, and bond with their companies, it is difficult for companies to sustain their corporate competency with too many irregular workers. There are up to 40 labor-related laws and regulations in India. Some provisions of these laws contradict each other and cause confusion in industrial fields. The Indian government is attempting to unify these 40 complex laws and regulations into four, although the process is being delayed by political opposition.

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Moreover, women's economic participation is relatively low in India compared to other countries. It is still a social norm in India for women to take care of the home, so companies are often reluctant to hire female workers. In contrast, textile plants in Bangladesh make full use of the female workforce, and China also has high female labor-force participation. However, while some women in India work in specific fields, for example call centers for US customers, IT software development, or the public sector, many others in rural areas cannot be involved in labor-intensive light industries and fail to contribute to economic development.

Second, the lack of infrastructure entails high costs. Despite great efforts by the Indian government, the country's infrastructure, including roads, ports, and power plants, and water supply facilities, remains far below global standards. India's major roads for logistics are simple highways, and expressways are still in their infancy. According to an annual report by the Ministry of Road Transport and Highways of India, the total length of highway and expressway networks in India reached 103,933 kilometers in 2016, but there is no exact length provided for expressways alone. There are only media assumptions about their exact lengths, and it is estimated to be less than 2,000 kilometers. The total length of the expressway network in Korea is 4,193 kilometers as of 2016, according to the Ministry of Land, Infrastructure, and Transport of South Korea. Given that India is approximately 31 times the size of South Korea, India's expressway infrastructure is dramatically substandard. In China, the total length of the expressway network reached 131,000 kilometers in 2016, and had surpassed the overall length of the American Interstate Highway System in 2011.

The substandard state of infrastructure is not confined to roads. India's power supply conditions are gradually improving, but remain inferior in terms of both quality and quantity. Due to the unstable power supply and frequent blackouts, individual generators are commonly used in workplaces. India's electricity rates appear reasonable

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Table 2. Lending Interest Rate 2016 (%)

	China	India	Thailand	Vietnam	Malaysia
Lending rate	4.35	9.7	6.3	7.0	4.5

Source: World Bank, IMF

at a glance, so foreign establishments may consider doing business there to be competitive. However, such companies encounter higher electricity rates than expected when actually doing business in India. Power shortages are a prolonged and a chronic issue in the country for a number of convoluted reasons, including difficulties with land expropriation for building plants, environmental issues stemming from coal mining for power generation, and high rates of transmission and distribution losses. Substandard infrastructure raises costs for companies, and their price competitiveness declines in the global market.

Third, India suffers from insufficient public financial support and higher interest rates compared to its competitors. It lacks appropriate directed credit programs to support particular industries or companies, unlike in Korea and Japan in the past and China at present. With an extended period for return on investment, the process industry requires low long-term interest rates for development. Without providing appropriate preferential treatment, the Indian government cannot directly support the industry. To be certain, India has debt restructuring schemes, such as the 5/25 scheme, to direct financial support to insolvent companies and industries and help them stay afloat. However, such debt recasting schemes are neither as broad nor as intense as those offered in China. Major banks in China are state-owned, as are large companies in the process industry. Although supervisory authorities in China may be either the central or local governments, they all use national assets to address bad loans, so the link between banks and companies is relatively strong. In order to create or retain jobs, local governments can allow state-owned banks under their jurisdiction to lend significant amounts of funds to state-owned companies, extend repayment deadlines, or convert debt into shares of companies in temporary financial distress. This

so-called government-led financing can produce side effects if mis- or over-used, but it can also play a significant role in nurturing selected industries for a short period of time.

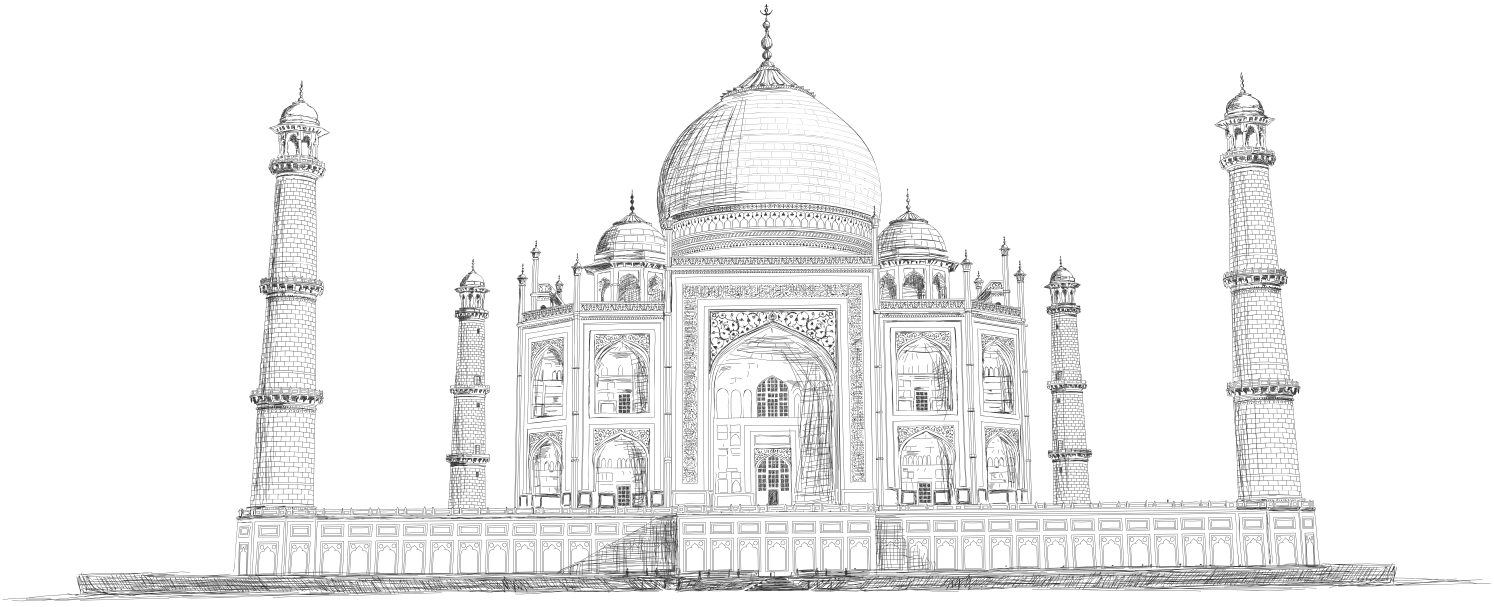
Another disadvantage in India is high interest rates. The country's average lending rate reached as high as 9.7% in 2016, while China, Thailand, Malaysia, and Vietnam maintained rates of 4.4%, 4.5%, 6.3%, and 7.0%, respectively. This means that Indian companies must finance themselves at higher costs than their foreign competitors. With high interest rates, it is difficult to nurture the process industry given its massive funding requirements. In the past, Korea, China, and Japan also experienced high interest rates, but they addressed the problem by taking advantage of directed credit programs. However, as the Indian government is itself suffering from considerable chronic deficits, it absorbs funds from loan markets rather than offer financial support. Given this difficulty in obtaining finance in the open markets, companies suffer from high lending rates.

The fourth disadvantage involves the complex issues related with securing land, which will be difficult to resolve in India over the short term. Rapid economic development requires the timely implementation of mega-scale infrastructure

Rapid growth in Indian steel demand seems difficult. India will indeed enjoy consistent economic growth and steel demand will sustain a gradual upward trend, although it will remain far from doing so rapidly.

projects, such as construction of nation-wide logistics networks, electric power facilities, and industrial or residential complexes. To this end, securing land is a prerequisite. Once construction sites are prepared and infrastructure is ready, industrial or residential facilities can be erected on the site and the regional economy grows rapidly. Securing land is the first step in this process, but it poses the greatest challenge in India. As a communist state, the Chinese government in principle holds ownership of all land, but individuals and private companies can use land by obtaining land-use rights from the government. When the period of such rights expires, the land can be reclaimed and redeveloped by the government, so the administrative process is relatively simpler than in capitalist states. Of course, China experiences its own problems related to land expropriation, such as riots, but these issues are far less severe than those encountered in India.

First of all, it is difficult to verify land ownership in India. Without proper land registers in place, it is no easy task to identify the rightful owner of a plot of land. As lawsuits take considerable time to be settled in the country, any land-related lawsuit can hinder the smooth implementation of projects. Therefore, it takes much longer in India compared to in other countries to implement mega-projects on expropriated private land. Making use of public land is also challenging. Not enough land is held by the government, and much of what exists is forest areas housing illegal residents. They strongly oppose any removal orders from these areas, and it often boils down to a hot-button political issue. This phenomenon is called "encroachment." The origin of the term dates back to when India gained independence from Britain in August 1947, or even earlier. Without their knowledge, residents living in such forest areas who had no awareness of land registration found their land ownership reverting to others or the government. The homeless poor staged riots. In the worst case, they became communists and resorted to armed revolt. These communist rebels in India are called Naxalites. The eastern parts of India, with Naxalite strongholds in its forest areas, suffer poor safety and security. This land is-



sue is the Achilles' heel of Indian economic development. Indian governments have been making tremendous efforts to address the matter, but it has proven arduous to solve this deeply-rooted problem.

Will India become the next China?

India has surpassed China in terms of economic growth. However, its economic development has mainly been propelled by the service sector, and India's steel-consuming industries, such as manufacturing and construction, are relatively weaker than those of China. As examined in this article, there are multiple reasons why India's economic and social indicators lag China's. There is also a fundamental distinction between China and India in terms of their ability to secure land, the most fundamental issue. For these reasons, it is difficult to support any anticipation that India's steel demand will grow rapidly in the short term at a level as did China's. To make matters worse, India's proportions of gross fixed capital formation and secondary industry in GDP have declined ever since peaking in 2007. As the difference in this measure between India and China is expanding, India is more likely to consume fewer steel products rather than see its steel demand grow in proportion to the economy. In conclusion, rapid growth in Indian steel demand seems difficult. However, India will indeed enjoy consistent economic growth and steel demand will sustain a gradual upward trend, although it will remain far from doing so rapidly.