

# CHINA'S STEEL INDUSTRY AS A DRIVING FORCE FOR ECONOMIC GROWTH AND INTERNATIONAL COMPETITIVENESS

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The theory that we shall seek to elaborate here puts considerable emphasis on technological features of China's steel production, its emergence as the world's most significant steel producer and main manufacturing base, and the transitory decline in steel demand related to the international financial crisis. The purpose of this article is to gain a deeper understanding of the global incorporation of China's steel enterprises, its portion of worldwide steel consumption, and its industrial policy scheme for the steel sector. This research makes conceptual and methodological contributions to the steel products supply chain in China, the deficiencies of production overcapacity and atomization in China's steel industry, and market chances for the Chinese steel sector.

*Key words:* steel industry, China, economic growth, global market

## INTRODUCTION

China's emergence as a relevant economic power [1] is a crucial determinant in comprehending and estimating the international steel markets and prices. China's overhauled steel capacity should be employed progressively to export steel in excess as internal demand is covered. China's steel sector is crucial to the long-term functioning of its economy, acting as an indicator of the entire economy [2], but, with its own constraints, it may not maintain the production capacity improvement at the present rate. During China's fast industrialization and urbanization, internal demand for steel has risen. With the boost of crude steel output, Chinese steel provisions has satisfied internal demand and has emerged to outstrip consumption: crude steel is mainly manufactured in blast and basic oxygen furnaces, which produces iron ore and coke critical raw materials. When steel prices achieve lucrative levels, steel mills with ineffective capacity enhances production, culminating in descending influence on steel product prices [3]. The development of the steel industry has profited from the fast economic growth and powerful internal demand, and the steel sector has led to China's economic improvement. For long-run sustainable development, internal steel corporations should practice self-discipline in enlarging their production capacities. State-oriented capital financing to the significant steel-consumption industries is relevant. The sudden drop in external using up has seriously impacted the export of steel goods from China. The prime concern undertaking for the steel industry is to hinder over-production [4].

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## THE STRONG ECONOMIC GROWTH IN CHINA – A POWERFUL DETERMINANT FOR THE FAST EXPANSION OF ITS STEEL INDUSTRY

China's swiftly enlarging steel output and its demand for first-rate ores [5] turned iron ore into a merchandise in significant demand on the international market. The Chinese steel sector functions in a feasibly market-oriented setting. The Chinese steel manufacturers tend to be more vertically incorporated by sharply searching for and/or obtaining new iron ore resources and providers. China's main iron and steel producers have been dynamically aiming to secure provisions of raw materials. Chinese steel is employed chiefly in its internal market (the bulk of Chinese steel has been utilized to provide internal economic growth), but recent and updated steel capacity may be employed progressively to export steel in excess after internal demand is adequately satisfied. [3] (Tables 1-2)

Table 1 **Apparent steel use (2009 to 2015) (million tons finished steel products) [6]**

2009	2010	2011	2012	2013	2014	2015
551,4	587,6	641,2	660,1	741,2	748,3	754,3

Table 2 **Apparent steel use per capita (2009 to 2015) (kilograms finished steel products) [7]**

2009	2010	2011	2012	2013	2014	2015
413,1	438,0	475,8	487,6	515,1	524,3	533,6

China's steel industry is monopolized by several important state-owned enterprises (SOEs) with many small- and medium-sized enterprises (SMEs), covering a tiny share of steel output. For long-run sustainable improvement, all internal steel enterprises should curb their pro-

duction output. The shortage of production strengthening brings about corresponding development throughout areas and 'cut-throat' style rivalry [8] among internal steel enterprises. Mergers and acquisitions (M&As) are the essential policy for the improvement of China's steel sector, assisting China in handling the effect of the international economic downturn through production cost reduction [9], and fortifying the worldwide competitiveness of the steel enterprises through market share enlargement. Internal steel manufacturers have faced opposition from regional protectionism. The fast improvement of energy-intensive steel output has generated significant environmental deterioration and contamination [10] in zones around the steel companies (extremely contaminating and energy-swilling small steel companies should be closed down). [4] China has turned into the most significant steel manufacturing and consuming economy, now covering almost 50 % of the world's entire steel production and consumption. The proportion of steel used up by consumption will outperform the proportion of steel used up by investment. The correspondence between raw material value and steel goods value has been fortified. China's related steel exports cover 10% of its supposed steel utilization because of its tremendous volume. The Chinese steel sector should advance new technologies and goods, and to enhance its supply chain and check to meet the demand. Numerous Chinese steel corporations have lately invested considerably in environmental preservation facilities: not satisfying the emission demands they are confronting the threat of being forbidden from manufacturing. [11]

## THE DYNAMICS AND PERFORMANCE OF CHINA'S STEEL INDUSTRY

China has updated steel output via streamlining the steel industry through closures and reinforcement. Marginal shifts by its steel sector in the orientation of enhanced exports may generate substantial market disturbances [12] for other providers. China has been striving to hinder its steel overcapacity and preserve stabilized growth. China's fast improvement in steel output necessitates a satisfactory and stable provision [13] of raw materials, affecting the international distribution and cost of raw materials and influencing the output expenditures and gainfulness of its rivals. When China brings off to maintain more supervision over production inputs, the Chinese steel sector may be braced to relevantly enlarge its proportion of the worldwide production and the export market. [3] China's steel industry has profited from the fast improvement of the Chinese economy. The swift growth of China's essential sectors has increased the request for top-quality steel goods (thanks to the tremendous state financing in significant steel-consumption industries, low-end steel output has been announcing acceptable growth). The steep decrease in external using up has seriously impacted the export of steel goods from China. The worldwide economic downturn has worsened the current obstacles of unreasonable capacity [14] and production decomposition in China's steel industry. Confronting lowered external demands, caused by the deteriorating international economic meltdown and undeter-

mined economic future, the foreign commerce of China's steel sector may further fall. For the purpose of fortifying international competitiveness, the steel industry will experience significant industrial reorganization, and may make outstanding advancement in acquisitions. [4]

Valuation mechanisms for the steel supply chain have been altered substantially in China. Derivatives for all the goods in the steel supply chain have been set up in China. The Chinese steel sector should advance its price risk management system for the purpose of dealing with price volatility and to preserve gainfulness. Steel suppliers have gained inexpensive loans from banks through the steel stock mortgage, and have steadily lost the role of a repository in the steel supply chain. Steel capacity enlargement is decelerating in China, and the lucrateness of the Chinese steel sector may be slowing down following the international financial downturn. The Chinese steel sector should advance cutting-edge goods to satisfy the prerequisites of purchasers through R&D and innovation to further the competitiveness of steel firms and enhance profit margins. [11] The Chinese steel manufacturers preserve a low degree of gainfulness (3% in latest years). The Chinese economy is goaded by state-oriented financing [15] in areas with significant steel demand – e.g. automobile and infrastructures whose growth and development require vast quantities of steel. The intensive margin monopolizes the market enlargement in the Chinese steel sector. The latter is tremendously import-reliant on iron ore, does not have sufficient bargaining capacity to restrict price rises [16], and has a small market concentration [17], emerging from relevant degree of entry and zonal limitations (most provinces have numerous steel manufacturers). Regional industrial GDP puts forth an outstanding positive impact on zonal steel production (the latter is not influenced by the request from other provinces). The character of firm heterogeneity alters the market structure dynamics in the circumstances of the vertical market connection [18].

The steel industry is especially cyclical being tightly associated with the economic cycle. Construction and fabrication are substantially instrumental in economic output (GDP is associated with steel consumption). As economies improve, there is a sheer linear rise in per-capita steel utilization as per-capita GDP increases from a low infrastructure. China's per-capita steel utilization has increased considerably, with base build-out and possessions supplying the main impetus. Steel-intensive base financing supports economic improvement in the short-run. China is relevantly dependent on the construction industry to direct its steel demand. Steel mills in China are to strategically devise their product fusion and future setting to harmonize the steady switch in steel applications. Erecting mini-mills in promising consumption regions by employing *electric arc furnaces* (EAFs) is a cost-effective manner of enlarging long-run steel production. Mills should expand affordable and extremely well-planned undertakings to optimize gainfulness considering the structural switch in steel applications, and customize their enlargement to the augmenting share to demand from remote areas in prov-

inces. EAFs entail significant electricity utilization during the steel manufacturing process. Constructing EAFs to cut down the dependence on imported iron ore is a rather uncomplicated alternative for steel mills. [19] The fast enlargement of Chinese steel production has neither pursued a prescribed, intricate route supervised by administrative devisers nor been steered and regulated by the entire capacity of market forces. The broad geographical spread of steel manufacturing has brought about confined development approaches and interregional obstacles for commerce and investment. China is an important importer and exporter of both steel goods and significant raw materials (iron ore is the chief raw material for steel manufacturing). Imports are constituted of technology concentrated wares (e.g. electrical steel or galvanized sheet).

The export constraints for raw materials like coke and zinc generate a suppression of supplies on the Chinese market whereas diminishing provisions on the international market. The lucrateness of Chinese steel manufacturers is considerably backed by lowered input prices and export advancement for finished goods abroad. The undiminished sharp increase in crude steel production has determined China's mining sector to ceaselessly enlarge operations, and thus immensely enhancing the necessities of internal iron ore. [20] (Figure 1)

## CHINA'S STEEL INDUSTRY'S INTERACTION WITH THE GLOBAL MARKETS

The Chinese steelmakers should have an anticipatory position in branching out goods and improving quality to cover the demand of the fabrication, new energy means of transport and ship-building sectors. The increase in steel manufacturing is displayed by the fast rise in imports of iron ore, an essential raw component of steel production. Overcapacity may include supplementary demands to the descending tendency of steel prices taking into account the fall in external consumption. The plunge in internal steel prices would additionally impact the earnings of China's steelmakers. China's steel industry should accelerate its structural readaptation process and remove old-fashioned production methods. [4] China will require more significant-value-added steel goods, for example alloys and cold rolled sheet, to back manufacturing increase in the fabrication industry. Steel production and finishing technology are underdeveloped, and internal demand for top-quality goods has to be covered by imports. Electric steel production is the key option for China's steel mills granted its diminished expenditure, adjustability and capacity to produce top-quality goods. China's huge steel mills will broaden by increasing their production capacity with government furtherance, and through fusions and acquisitions. [17]

Chinese steel manufacturers have confronted with intensifying deficiencies, and increasing prices have long switched to the international market for their iron ore necessities. The small amount of steel manufacturers accepted for ore imports may not acquire quantities greater than their own consumption demands. Chinese steel imports

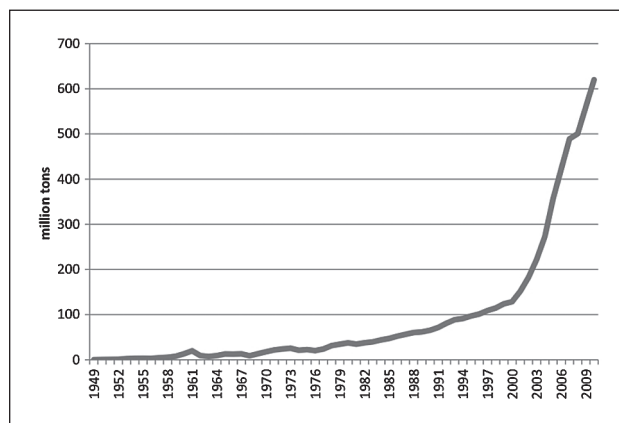


Figure 1 Chinese annual crude steel output since 1949 [7]

have generally been monopolized by significant valued added products. Suppressing essential inputs for steel manufacturers within the Chinese market functions to augment internal provisions and reduce input prices for Chinese steel manufacturers. Economic policy makers have planned to advance global incorporation of their internal steel sector via trade. The fast improvement of the Chinese economy has boosted a swift enlargement of internal steel manufacturing that has directed the formerly self-sustaining steel industry towards significant degrees of import reliance and sheer price rises for raw materials. All important Chinese steel consortiums are dynamically advancing the increase of international sales and purchaser service arrangements. Iron ore mining, coking manufacturing and steel production are capital concentrated sectors with extended incubation periods. [20] (Tables 3-4)

Table 3 **Continuously-Cast steel output (2013 to 2015) [7]**

Million tons			% Crude steel output		
2013	2014	2015	2013	2014	2015
767,4	773,8	771,4	98,5	98,7	98,3

Table 4 **Steel production and use (2013 to 2015) [7]**

Geographical distribution (2013)	Geographical distribution (2015)
Crude steel production World total: 1,606 million tons (China: 48,5 %)	Crude steel production World total: 1,727 million tons (China: 49,6 %)
Apparent steel use (finished steel products) World total: 1,481 million tons (China: 47,3 %)	Apparent steel use (finished steel products) World total: 1,623 million tons (China: 48,4 %)

The enlargement of steel production has been an outstanding determinant of China's need for raw materials, particularly iron ore and coking coal. The steady growth in steel production has undergone a noticeable increase in the 'steel strength' of the Chinese economy. The probability of persisting significant rates of economic growth [21] indicates that China's imports of raw materials will maintain relevant. The association of first-rate economic growth and advancing steel strength has generated a continuous increase in China's proportion of international steel production. Numerous important Chinese steel manufacturers are state-owned, and the coastal provinces cover 65 per cent of crude steel production. Endeavors to vary supply [22] may influ-



ence the Chinese steel industry's acquiring of raw materials. Significant value 'flat' goods, which are employed in a widespread way in fabrication (such as steel strips and sheets), have explained an increasing proportion [23] of production. China's iron ore manufacturing has typically kept step with expansion in steel production. The chief cause of steel demand is the financing of dwellings, structures and machinery. The construction industry is the most significant direct buyer of Chinese steel goods. The production and utilization of steel tend to increase to a greater extent, supporting substantial demand for both iron ore and coking coal. [24]

## CONCLUSIONS

Technological progress is relevant for augmenting energy efficiency [25] and enhancing steel manufacturing, and decisive to attaining sustainable steel development and environmental preservation. The steel industry should strive hard to acquire energy preservation and expeditiously employed input energy. China's steel sector has constituted itself as an insignificant value-added, effortful steel manufacturer, the improvement of significant value-added goods stagnating. The Chinese government should readapt the production design of the steel industry and advance it to the significant value-added chain. The overindulgent environmental standards and procedures for the steelmaking industry must be further fortified. [4] The iron and steel industry is the most significant energy consuming branch worldwide, being responsible for nearly 18% of China's entire energy consumption. Crude steel manufacturing is monopolized by a few important state-owned companies. Coal is the main form of energy utilization in the Chinese iron and steel industry, but its prominent status [26] is deteriorating. The iron and steel sector is a leading driver of CO<sub>2</sub> emissions and other contaminants in China. Electricity, natural gas and oil are equivalents for coal in the manufacturing of Chinese iron and steel. China may shift from greenhouse gas releasing coal to more uncontaminating energy sources, maintaining the capacity to boost its iron and steel industry, while cutting down the detrimental environmental consequences. [27]

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