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WSD's steel experience, steel database and availability of steel statistics are the principles for performing steel forecasts, studies and analysis for international clients. WSD seeks to understand how the "pricing power" of steel companies the world over will be impacted by changes in the steel industry's structure. The views and opinions expressed in this article are solely those of World Steel Dynamics and not necessarily those of AIST.



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Per capita steel consumption: It's not the driver, it's a result

Key point: Fixed asset investment drives steel demand, not per capita income

For decades, WSD has claimed that per capita steel consumption is not the primary driver of steel consumption — it's the result of other developments. Principally, the main driver is a country's fixed asset investment (FAI) (a proxy for gross domestic capital formation that's a GDP figure), followed by household expenditures. Household consumption in 2017 was 67% of GDP in the U.S., 59% in India and 38% in China.

Steel consumption is measured as a quantity consumed (metric tons) over a period of time (typically a year). Therefore, steel consumption is measured as a rate, or a speed, at which something is happening. The number of people present in a given location has no bearing on this rate; rather, it is the velocity of spending on fixed asset investment and household spending that determines the rate of steel consumption. In other words, how fast one spends capital in the form of FAI or household spending — and its steel intensity — determines how much steel is consumed at a specific location in a fixed amount to time. While the size of the population reflects the aggregate potential to consume steel, how much steel is consumed per year is purely of function of the velocity of capital. The biggest proof of this situation is that China and India have roughly the same size populations, yet they consume vastly different amounts of steel because they deploy capital at much different rates.

- China has about 1.4 billion people, with steel consumption about 900 million metric tons/year — or, 0.64 metric tons per capita. Fixed asset investment in China is about 44% of GDP of about US\$11 trillion/annum, or US\$5 trillion/year. Fixed asset investment — i.e., construction and capital spending — may account for about 92% of Chinese steel consumption.

- India has 1.35 billion people and consumes about 100 million metric tons of steel/year — or, about 0.074 metric tons per capita. FAI is about 31% of GDP of US\$2.8 trillion/year, or about US\$0.9 trillion/year. FAI in India may account for about 85–90% of steel demand (a lower percentage of the total than China because of higher household spending as a share of GDP).

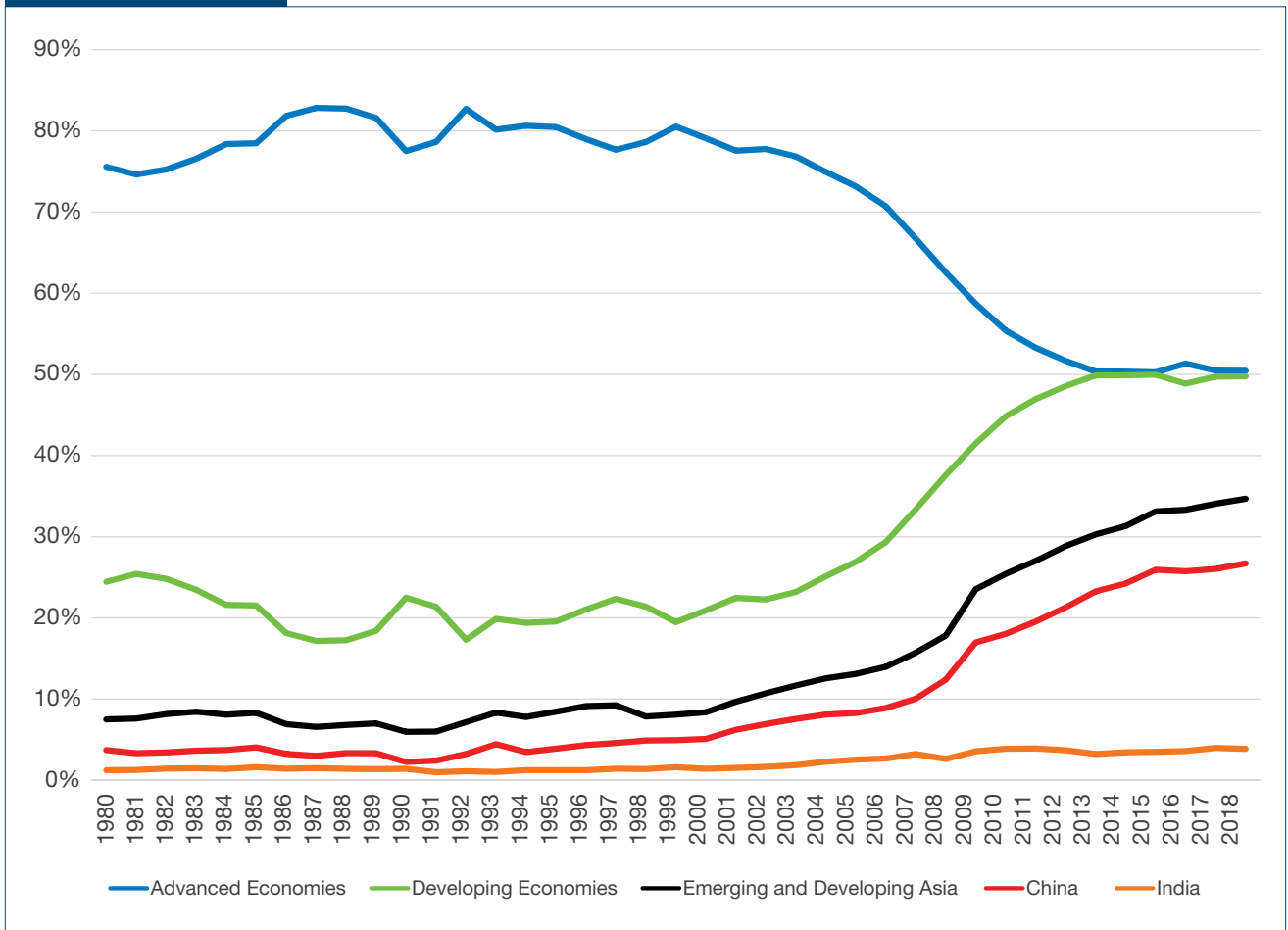
Regarding the U.S., it has about 330 million people and consumes about 110 million metric tons/year — or, about 0.33 metric tons per capita (roughly 52% of the figure in China). Yet, average U.S. household income at US\$47,000 per household is 4.7 times the Chinese figure of about US\$10,000. In the U.S., gross fixed capital formation is about 18% of its US\$20 trillion GDP, or about US\$4 trillion/year. FAI in the U.S. may account for about two-thirds of steel consumption.

Clearly, China's FAI per dollar of spending is far more steel-intensive than the U.S. and India. Steel consumption per US\$1 trillion of fixed asset investment is about 180 million metric tons in China, 25 million metric tons in the U.S. and 111 million metric tons in India. Here's another proof of this situation: Chinese rebar production this year may be about 230 million metric tons versus the U.S. at about 8 million metric tons and India at 25 million metric tons.

China's high savings rate, at about 44% of GDP (when including households, industrial companies and government), generates far higher flows of funds to its banks, relative to the country's size, than is the case for the U.S. with a savings rate at 18% of GDP and India at 31% of GDP.

The Capital Fundamentalism economic theory — that promulgates the benefit of raising FAI to GDP — is supported by the figures mentioned

Figure 1



Regional/country share of global investment. Source: International Monetary Fund, WSD estimates.

earlier. One of the factors tied to this theory is the propensity of a country to respond to capital inputs — this phenomenon is called a country's "social capital." After World War II, the "social capital" of Western Europe and Japan was so high that relatively moderate capital infusions had high multipliers in terms of the impact on economic activity.

Fig. 1, based on International Monetary Fund figures, shows since 1980 the share of global investment for these groups: advanced economies, developing economies, the combined emerging and developing economies in Asia, China, and India. The advanced countries' share of the total is down from 80 in 1999 to 50% in 2018, with China's up to about 27% from 4%, respectively.

Looking ahead to the next decade, WSD believes that increasing globalization — reflecting the Information

and Technological Revolutions — will lead to increasing "social capital" in many developing world countries. For example, the Information Revolution has made detailed information so ubiquitous that it's more difficult for corrupt government officials to divert as much of their country's funds, to their own benefit.

The Technological Revolution is providing higher returns on capital investment given the often sharply lower operating costs and improved quality at new factories versus existing ones.

Regarding India, WSD forecasts its "social capital" to rise sharply in the next decade. If so, its steel consumption should also be booming. Granted 6% per annum steel production growth in India in the next decade, its steel production in 2028 may be about 192 million metric tons versus about 106.5 million metric tons in 2018.

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