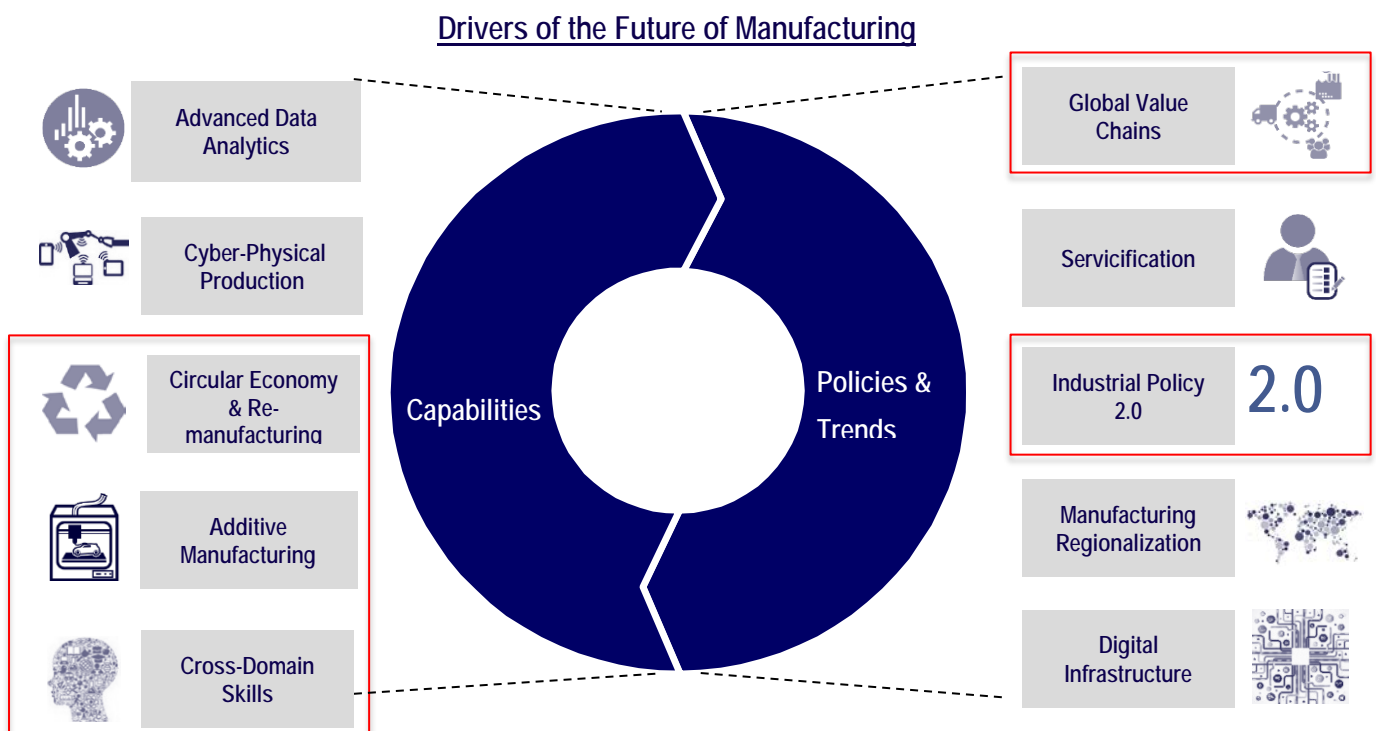
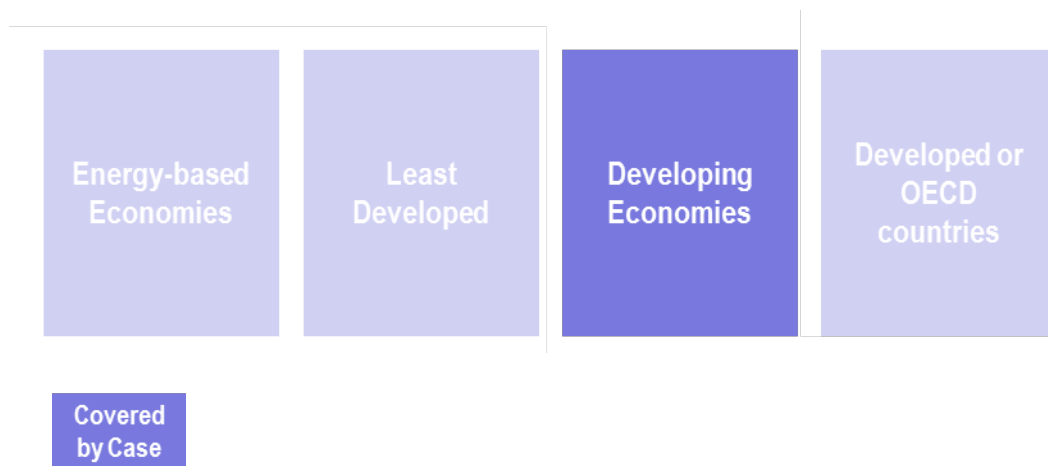


Case 4

China's Manufacturing Successes and Pitfalls



Source: World Economic Forum Global Agenda Council on the Future of Manufacturing, Whiteshield Partners framing



1. Challenge Confronted

Over 20 years ago, China's manufacturing industries were backward because of its isolation from the outside world, a centrally planned economy and the lack of technological advancement. Since then, the country has made tremendous progress in developing its manufacturing industries. Its total manufacturing output has been the largest of any country since 2012, outgrowing that of the United States. China has overtaken the United States as the largest trading country since 2013; much of its imports and exports are in manufactured goods.

However, China's manufacturing development has stagnated in recent years. Most products produced by the country's manufacturing firms are of low technological complexity. Many small to medium-sized enterprises (SMEs) in manufacturing, making very low margins from these products, could grow their business mostly through high production volumes. Now, these SMEs are facing difficult challenges to survive because of the slowdown in export markets, the resulting shrinkage in overseas orders and the rapid rise of production costs (e.g. labour, raw materials, energy, land). Furthermore, environmental conditions are severely damaged. Tougher environmental regulations are being adopted, thus resulting in increased pollution abatement costs.

The government and civil society have recognized these challenges and have committed to transforming the country's manufacturing industries.

2. Solution Used

- In earlier years, when China attempted to develop its manufacturing base, the government adopted an open-door policy. It effectively utilized its huge potential market size to attract foreign direct investment (FDI) and leverage the importing of technologies and upgrading of technical capabilities.
- Its entry into the World Trade Organization (WTO) was another timely and rare opportunity for China to participate in the global manufacturing value chain. Many multinational corporations moved their production activity to China, which greatly impacted the country's manufacturing landscape. Following the movement of production, many technical centres as well as research and development (R&D) facilities were established to support local production and market needs.
- To transform and upgrade its manufacturing industries, the country recently launched Made in China 2025, a national strategy. It focuses on original innovations, "internet plus" and technologically driven manufacturing, such as 3D printing, digital design and manufacturing, and robotic automation.
- The government also tries to stimulate capital markets to boost the next round of growth in manufacturing industries, including incentives to pursue overseas expansion through mergers and acquisitions.

3. Lessons Learned



- In the last 20 years, China's strategy of "leveraging the market for technology" has worked relatively well. Chinese manufacturing companies have significantly developed their technical capabilities and have become world market leaders in over 200 product categories. A significant, sophisticated supply network has been established, including both global multinational players and indigenous local firms.

China's Manufacturing Successes and Pitfalls

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Author: Jun Ni

Entity involved: University of Michigan (USA)

Point of contact: Jun Ni
(junni@umich.edu)

Key facts:

- China's manufacturing industry was backward until the mid-1990s.
- The Chinese government effectively used its market size to attract FDI and to leverage the importing of technologies.
- China's total manufacturing output has overtaken that of the United States and made it the largest manufacturing country since 2012.
- China also became the largest trading country in 2013, with much of its imports and exports in manufactured goods.
- Rapid growth in manufacturing has also caused severe damage to its environment and a rise in production costs, making China less competitive compared to other countries that produce at low cost.
- Workforce training and talent development are important parts of the national strategy to pursue advanced manufacturing.
- The government recently launched Made in China 2025, a national strategy to transform the country's manufacturing industry.



- Product development capabilities have also been greatly improved. This is a good example of utilizing government policies to attract FDI that brought in not only financial resources, but also technical knowledge and management skills.



- Although China has a relatively strong central government, a lack of coordination exists among provincial and municipal governments. As a result, significant low-level duplication results in the waste of valuable natural and financial resources and the destruction of many promising industries (e.g. solar cell, automotive).



- China has three general categories of manufacturing enterprises: (1) multinational corporations (MNCs), wholly owned or joint-venture operations; (2) state-owned enterprises; and (3) privately owned businesses. The sophistication of technology among the latter two categories is generally lagging compared with the MNCs. The lack of an effective system for protecting intellectual property also indirectly hinders investment by these firms to develop new technology.

Description of the Work Performed

In the 1990s, particularly during China's 9th Five-Year Plan, the Chinese government realized the importance of manufacturing to economic development, the creation of high-paying jobs and national security. It set out to develop advanced manufacturing. One important strategy was to attract FDI by providing incentives to access its huge market. For example, the government started to open up the automotive market by allowing foreign corporations to form joint ventures to assemble vehicles in China. Once the floodgates opened, all major global automotive manufacturers established their footprints in various regions of the country. Chinese automotive production and consumption quickly surpassed that of many countries, and has been the largest market worldwide since 2008. The Chinese government also systematically invested to upgrade its physical infrastructure (e.g. airports, shipping ports, railroad systems, national highway systems, power plants and electricity transmission lines). Today, China has one of the best physical infrastructures in the world. Another essential strategy was to successfully negotiate its entry into the WTO, which greatly changed China's manufacturing landscape. Major original equipment manufacturers and their suppliers have gradually established their production operations and technical/engineering centres; many of these have become integral parts of their global production systems. The rise of China's manufacturing industry also contributed to a shift in business practice, such as global sourcing and global competition on pricing.

Although there are debates inside China about the effectiveness of using its market to exchange for technology, this strategy worked very well for the country's manufacturing industry. The strategy's naysayers would point to China's automotive manufacturing industry because the entire market is dominated by foreign-brand vehicles (with the exception of budget-priced vehicles). Proponents of this strategy use China's high-speed train manufacturing industry as a prime example of successfully leveraging its market position to import technology. In a very short period of time, China's high-speed train manufacturing industry became a highly competitive force in the global market by licensing technologies or working with companies from Japan, Germany and France. The country has already built the longest and largest high-speed rail network in the world, and started to bid for and won foreign high-speed rail projects.

Recently, the Chinese government launched Made in China 2025, a national strategy to further advance the country's manufacturing competitiveness. It recognized that, although China's total manufacturing output is ranked first in the world, its core manufacturing competitiveness still lags that of some of the most developed countries, such as Germany, Japan and the United States. It plans to systematically upgrade its manufacturing base over three decades. Heavy emphasis has been put on original innovations of Chinese manufacturing companies, with a national innovation strategy that includes coordinated innovation teams (Xie-Tong-Chuang-Xin) to help industrial firms develop innovation and technical

capabilities. The goal is to shift from “Made in China” to “Innovated in China.” The commitment to realize this ambitious national strategy is demonstrated by the State Council's dedication of several cabinet meetings to discuss Made in China 2025. Renowned scholars and academicians of advanced manufacturing were invited to present to Chinese Premier Li Keqiang and his cabinet members on the latest developments in the field, such as 3D printing, robotic automation and high-end manufacturing.

Since 2009, the Chinese government has also established the 1,000 Talent programme to systematically attract top-level talent from around the world to work for Chinese institutions and corporations. This strategy has worked reasonably well to attract not only Chinese talent overseas, but also non-ethnic Chinese talent. The influx of this top talent will certainly contribute to further development of the country's manufacturing industry.

Many progressive Chinese manufacturing firms have also started to pursue overseas opportunities by merging with and acquiring other companies (e.g. the acquisition of Volvo by Geely; IBM's PC business and Motorola Mobility's smartphone business by Lenovo; A123 by Wanxiang), establishing R&D activities in North America and Europe, and developing production facilities. The Chinese government also developed various incentive policies to encourage such kinds of overseas expansion.

Chinese President Xi Jinping also proposed a One Belt, One Road (OBOR) strategy to collaborate with many of the nations involved in the geographical regions covered by the OBOR plan. China also launched an Asian Infrastructure Investment Bank (AIIB) initiative. Under the OBOR strategy and AIIB umbrella, more investment and infrastructure construction projects will become possible targets for Chinese manufacturing firms. Although these projects may not necessarily help to upgrade the firms' technical capability, they can be a short- to medium-term solution to outsource the overcapacity of these firms.

Key Outcomes

The key outcomes of China's national manufacturing strategy over the last 20 years include: (1) the effective leveraging of its huge market potential for advanced technologies and attraction of FDI; (2) the rebirth of its manufacturing industry and surge in exports; (3) a greatly improved technical capability in product innovation, manufacturing process development and management skills; and (4) the establishment of sophisticated supplier bases across different industries, the creation of manufacturing clusters in various geographical regions and the acquisition of technical know-how.

However, the rapid development of China's manufacturing industry is having some negative impact, including environmental deterioration and inefficient energy consumption, and chaotic expansion resulting in overcapacity and low-level competition (e.g. the solar power industry, auto assembly, wind turbines, LED). This low-level competition has unnecessarily wasted valuable natural as well as financial resources that could be used for advancing new innovations and new growth opportunities.

Drivers & Enablers



Policy to attract FDI and open market access



Shared vision and public-private partnership



- Quality and quantity
- Skills and processes
- Exports

Barriers

- **Rapidly increasing production costs** and the slowdown in export markets caused Chinese manufacturing firms to run below capacity and incur financial losses.
- The extreme pressure to clean up environmental pollution and the competition from other low-cost countries increased the **need to upgrade the entire manufacturing sector**.
- Transforming and upgrading is a long and hard journey for many state-owned and small to medium-sized enterprises, due to the lack of reserves of technology as well as limited R&D and innovation capability within these enterprises.