

China on the way to be a global innovator

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China is fast transitioning from low cost manufacturing to a higher value, innovation-led economy. The present brief is derived from the recent book “Created in China” (*), released in Chinese in 2017. We first look at the metrics of innovation, and, then, the patterns followed by China, as it becomes a global innovator.

1) Metrics on China’s innovation

Innovation is about quality of output and not quantity of input. How does one properly measure “quality of output”? Difficult....Currently, innovation metrics include:

Investments in R&D: this percentage of China’s GNP (Gross National product) rapidly moved, from 0,5 % in 1995, to more than 2% in 2016. The objective is: 2,5% in 2020, overtaking the average investments of the countries of the European Union in this area.

Given the rapid growth of China’s economy, absolute numbers are even more impressive. In 2017, R&D investments in China are expected to be close to \$ 400 bio, as compared with \$ 520 bio. for the USA . Following the current trend, China may well overtake the USA around 2023.

Patents output: in 2015, China granted 263 000 patents to domestic applicants. China's top patent owners are the telecommunications companies ZTE and Huawei, and the car-maker Chery. Patent statistics is only a proxy indicator of innovation: the quality and the business potential of the invention are more important than the number of patents.

In the case of China, this indicator is particularly questionable, since the national and provincial governments give incentives to firms and academics for filing patents. Also, "utility patents", valid for ten years, as opposed to 20 years for invention patents, are of dubious value. In all, it may be estimated that roughly two thirds of China's patents are close to being worthless. Recently, China has begun an effort to focus on quality of IP (Intellectual Property).

Non technical innovations: the metrics above concern technical innovations. Many important innovations have nothing to do with technology; one example is the self service, which revolutionized retailing in the 1950s. Indeed, most advances in the services sectors are not patented. Thus, one firm may copy the service offered by a competitor.

In China, innovations are very focussed on creating value from an activity, not on technological prowess. They often concern specific aspects of business models: the manufacturer of refrigerators/air conditioners Haier guarantees one day delivery by imposing this condition to the

delivering sub-contractors. Mobile phone-maker Xiaomi hardly advertises and mainly sells on internet, without producing anything itself.

Furthermore, product innovations often result from numerous, small adaptations of existing products; these changes are often not technical in nature, and not patented, but their user-friendliness makes it possible for the offerings to succeed in the demanding Chinese market.

In brief, metrics, commonly used to “measure” the innovation level in China, are not extremely relevant, because their focus on technical innovation does not enough take into consideration elements central to China’s innovation scene. On the other hand the patent output is not convincing.

2) Patterns for China becoming a global innovator

Alongside SOEs-state owned enterprises, private firms increasingly constitute the essential engine of the wealth-creation process. They operate, however, in an environment, where the public sector is extremely powerful. Patterns of innovation in China may be described as follows:

Chinese society is highly entrepreneurial, eager to and extremely good at effectively *extracting value from an activity*. Chinese consider innovations in a totally market-

oriented way. They are ready to experiment state owned enterprises, and rapidly modify their offerings. Technical knowhow constitutes a tool to be successful in the market place.

Leader in the internet: China is fully engaged with internet, with more than 800 million users in 2017. Highly user-friendly WeChatPay, from Tencent, has been spreading like wildfire: in 2017, it is estimated that more than 400 million Chinese people use their cell phones for most of their payments - thus also offering a fertile ground to hackers. China dominates the world in mobile internet and “fintech”.

A manufacturing powerhouse: China wants to remain strong in manufacturing by fostering high-value creation in manufacturing, drawing on information technologies and robotics, as attested by the ambitious “Manufacturing 2025” programme. The latter echoes the German “Manufacturing 4.0” plan.

Copying while improving: Chinese entrepreneurs diligently redesign elements of offerings , in order to achieve better function-to-cost ratios and adapt them to the China’s market. Very distinct from counterfeiting, this represents a legitimate way to operate as a basis of the success of many Chinese companies, such as Baidu (adaptation of Goggle), or Alibaba, initially inspired by eBay.

A vibrant, demanding market, with consumers eager for novel offerings, is a good environment for firms to test, adapt and modify their offerings. China’s large market allows companies to very rapidly achieve scale. One example of this

is the sector of renewable energy, with China having the largest installed capacity in solar cells in the world.

Meta innovation refers to the intense interaction between manufacturers and suppliers, each contributing a novel piece, while building on each other's input, at breakneck speed. As in "the West", these improvements are not rocket science, but they are effective in bringing commercial success. The Shenzhen region, and its *makers' movement*, constitutes a remarkably effective example of this: difficult to imagine a more vibrant environment for innovation...

China's national and provincial governments are feel that, as in Japan and Korea, innovation constitutes a crucial ingredient of economic development. Government is a powerful actor, as it controls the land, license to operate, tax holidays, policies, etc... One of these policies concerns non-tariff barriers, such as standards, and practices, in order to favour domestic firms, with the pretext of promoting "indigenous innovation". This is currently particularly the case in the sectors of so-called "smart manufacturing" and renewable energy.

Becoming "global": a small number of Chinese firms have ventured abroad: Good Baby, Huawei, Lenovo, Haier. This internationalising process involves acquisitions, the largest so far being the purchase of Syngenta by ChemTech in 2016, recently approved by the European and US authorities. For the first time in 2014, Chinese investments going abroad have equalled the flow of investments going into China. We

are at the beginning of an increase of China's international investments, especially in Europe.

Chinese start up scene: China claims to have 1600 incubators. Many of them are NOT effective, as they appear to really be real estate speculation. The entrepreneurial scene, however, is vibrant. Between 2010 and 2014, the number of Chinese start ups has doubled to 1,600,000. Indeed their quality widely and potential greatly vary...as it does in the "West". Similarly with the quality and effectiveness of the numerous "incubators".

All these characteristics point to a thriving, rumbustious innovation scene, where the "shelf-life" of offerings on the market is short. To capture this breath-taking, and agile, succession of waves of new/improved offerings, replacing previous ones, we suggest the phrase: "puffs on innovation".

Conclusion

Strong entrepreneurial spirit, relentless market-orientation, agile and hyper-rapid implementation in a brutally vibrant economy, with consumers demanding outstanding quality to price ratios: these are some of China's descriptors. Combined with these is a strong government, relentlessly committed to foster innovation-led growth. Barring major mishaps, in the near future, China is expected to be one of the world's major sources of innovations, particularly in IT-enabled services.

China is the ultimate internet country, by the sheer number of users, as well as by the intensity of its usage. Already the biggest market for on-line shopping, China is leading the world in the mobile internet (Tencent is a key world actor in this area) and about to do the same in other fields.

Much remains to be done on the human factor, including developing a “research culture” in universities. A bottleneck to achieving the ambitious goals of “Manufacturing 2025” appears to be insufficiently abundant appropriate talent.

Fierce market/business orientation, uncanny ability to extract value from an activity, drawing on a large, vibrant and demanding market, extremely fast and agile in execution: there is much to learn from the “Chinese way” of innovating for China, but increasingly for the world. The fact that China is becoming a major source of innovations is good for China and good for the world.

(*) Created in China: how China is becoming a global innovator, by Georges Haour and Max von Zedtwitz (Bloomsbury, London, 2016)

<http://www.bloomsbury.com/uk/created-in-china-9781472925138/>

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