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ANALYSIS

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Make in China 2025 – is it on Track?

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The announcement on 19 May 2015 designed to transform China from a manufacturing giant into a world manufacturing power was made at a time when the US was distracted internally by the Presidential elections. This plan is to be followed by another two plans in order to transform China into a leading manufacturing power by 2049. Nine tasks have been identified as priorities: improving manufacturing innovation, integrating technology and industry, strengthening the industrial base, fostering Chinese brands, enforcing green manufacturing, promoting breakthrough in 10 key sectors, advancing restructuring of the manufacturing sector, promoting service-oriented manufacturing and manufacturing – related service industries, and internationalizing manufacturing. The 10 key sectors are new information technology, numerical control tools and robotics, aerospace equipment, ocean engineering equipment and hi-tech ships, railway equipment, energy saving and new energy vehicles, power equipment, new materials, medicine and medical devices, and agricultural machinery.

China had already announced a $150 billion investment fund to improve its domestic industry in 2014.

Rising labour costs and a new generation with little interest in toiling in factories forced a new tack. The manufacturing sector had reached a bottleneck, many of these products had reached market saturation, and it was hard to keep sales buoyant in sectors requiring little innovation or hi-tech development. Chinas working age population is also expected to fall sharply by 2030 – a result of the past 'one child policy" (SCMP 2018a). The drive is also coming from the bottom up, from the businesses and cities across China that know they must modernize or perish.

Ramping up rapidly, by October 2015, China's Ministry for Industry and Information Technology published a road map which laid out self-sufficiency targets in key sectors, including 80 per cent for new energy vehicles, 70 per cent for industrial robots, 50 per cent for aviation systems and 40 per cent for mobile phone chips – as well as local suppliers providing 70 per cent of 'basic core components and important basic materials' – all to be achieved by 2025 *(Addison 2018).*

On July 6, 2018, US started implementing 25 per cent tariffs on US$ 50 billion of goods imported from China – 818 products containing industrially significant technology including those related to "Made in China 2025" were targeted. In September 2018, the US added a 10 per cent tariff on an additional $200 billion of Chinese products. The situation was diffused at the G20 when the two leaders met

in Buenos Aires for the next 90 days. The US has told China that it is pursuing state directed acquisition of sensitive US technology for strategic purposes, indulging in unfair subsidies and intervention for the "Make in China 2025" programme, theft and unfair practices in relation to intellectual property as well as forced technology transfers, particularly at the local government level. Lately, there has been a spike in corporate espionage cases – which has focused on industries critical to Mr. Xi in the "Made in China 2025" program.

As the trade war escalated, by June 2018, references to the industrial policy disappeared from Xinhua reports and there was a general toning down of the rhetoric about a resurgent nation set to challenge the US.

Until Trump was elected President, Beijing's call to action to acquire foreign technology seemed to be going according to plan. Chinese companies acquired 10 European and US makers of advanced automation equipment in 2015-16 according to Mercator Institute.

The plan calls for the development of hi-tech sectors deemed to be important for future growth and establishes numerical targets for 2015, 2020 and 2025 (Shen 2018).

The 21st century conflict between USA and China is over technology. It covers everything from artificial intelligence (AI) to network equipment. The fundamental conflict is with respect to semiconductors**.** Companies from America and its allies such as South Korea and Taiwan dominate the most advanced areas of the industry. China, by contrast, remains reliant on the outside world for supplies of high-end chips. China imports most of the chips for these devices and last year the value was $260 billion. Semiconductors therefore figure prominently in the "Make in China 2025" national development plan.

Alarm bells have been ringing in the USA for a while. President Obama had blocked intel from selling chips to China in 2015, and stymied the attempts by China to acquire a German chipmaker by a Chinese firm in 2016. His administration had recommended taking action against Chinese subsidies and forced technology transfer. Taiwan and South Korea have policies to stop purchases of domestic firms by the Chinese companies and to stop the flow of intellectual property. The battle has intensified under President Trump. He has made a national champion of Qualcomm, blocking a bid for it from a Singaporean company for fear of Chinese competition. Earlier this year, an export ban on selling American chips and software to ZTE, a Chinese telecom company in breach of sanctions, brought it to the brink of bankruptcy within days. The US has imposed export controls on Fujian Jin Hua, another Chinese company accused of stealing secrets, and broader bans on emerging technologies is currently being thought of. On a visit to Beijing in May, German leader Angela Merkel called for 'reciprocal' market access and intellectual property protections, while the new US foreign investment Risk Review modernization Act will increase scrutiny of foreign investments in American firms. Fears of IP theft are not unfounded. China has reverse engineered – or replicated – foreign technology in the recent past. Examples include the Japanese Shinkansen bullet trains, and Russia's Sukhoi 27 fighter aircraft. Data security is another concern. On July 2, 2018, the national telecommunications and Information Administration, the US telecom regulator, rejected a 2011 application, filed by china mobile to provide services in the US market. Chinese investment is now concentrating on hi tech industries of the future (Gateway House 2018).

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Xi Jinping has urged Alibaba, Baidu and Huawei to plough money into chips. The US has legitimate concerns about national security requirements of being dependent on Chinese chips and vulnerable to Chinese hacking. The US however, cannot move the semiconductor supply chain to America due to numerous

suppliers who are in other countries. Qualcomm makes two thirds of its sales in China, which is currently a big market. Today, America has the edge over China in designing and making high end chips. It can undoubtedly slow its rivals. But Chinas progress will be hard to stop. China blends state and corporate resources in pursuit of its goals. It has an incentive programme to attract engineering talent from elsewhere, notably Taiwan. Companies like Huawei have a proven ability to innovate; blocking the flow of Intel chips in 20145 only spurred China on to develop its domestic super computing industry. Chinas bid to become a global semiconductor superpower is propitiously timed. As new technologies come in from quantum computing to specialized AI chips, China has a rare chance to catch up. The USA therefore will likely be adopting a three-pronged approach. First, to work with its allies in Europe and Asia to keep pushing back against unfair Chinese practices (such as forced technology transfer and intellectual property theft) at the WTO, and to screen out inward Chinese investments when security justifies it. Second, to foster domestic innovation. Third, to prepare for a world in which Chinese chips are more powerful and pervasive. That means developing proper testing procedure to ensure the security of Chinese made products, and tightening up on data handling standards so that information is not being sprayed about so carelessly (The Economist 2018).

In the field of artificial intelligence, which has assumed a key role in "Make in China 2025" plan, the process started with the issuance by the State council in 2017 of 'A next generation artificial intelligence plan'. The three-step road map involves keeping pace with leading AI technologies and applications in general by 2020; then to achieve AI breakthroughs by 2025, and finally to be the world leader in a domestic industry worth $150 billion by 2030. Beijing originally appointed four technology leaders – Baidu, Alibaba Group Holding, Tencent holdings, and iFlytek – as "national champions" to lead the development of innovational platforms in self-driving cars, smart cities, computer vision for medical diagnosis, and voice intelligence respectively. It recently added the Hong Kong start up Sense Time, which specializes in face and image recognition technology to establish an innovational platform for intelligent vision.

China appears to have achieved particular success in the field of facial recognition technology. Apart from contributing to China's efforts to build the world's biggest facial recognition enabled surveillance network, Sense Time has deployed AI technology and applications in smart cities, smartphones, internet entertainment, automobiles, finance retail and other industries. The Chinese ambitions have fanned fears in other countries of Chinese dominance in this sector, prompting China to tactically soften its approach at the world artificial intelligence conference in Shanghai in September and call for international cooperation in this area.

In the field of driverless vehicles, China has the world's largest car market – both for conventional and electric vehicles – but it still lags behind the US in developing driverless vehicles for the road. The Chinese government has set the goal of having a manufacturing industry in place for sensors and embedded chips with a value exceeding US$ 1.4 billion by 2020.

In the financial sector, China's national banks are testing AI applications for wealth management and fraud prevention. China's robo – advisory market – platforms that provide automated, algorithm driven financial planning – is expected to be the world's largest by 2020. Globally, the segment is expected to expand to US$ 6.5 trillion by 2025 from US$ 100 billion in 2016, according to McKinsey.

Today, America has the edge over China in designing and making high end chips. It can undoubtedly slow its rivals. But Chinas progress will be hard to stop.

In 2016, China added a total of 87,000 industrial robots, just slightly less than Europe and the United States combined. The Chinese robot market is slated to grow at an annual rate of 23.4 percent till 2019 as compared to the global growth of 13 per cent according to the

international Federation of Robotics. China's robot makers aim to supply 50 per cent of the domestic market by 2020, rising to 70 per cent by 2025.

Two thirds of the world's investments in Artificial Intelligence have been going into China and have enabled a 67 per cent growth in the industry just in the past year, according to research from Tsinghua University. China has an edge over the US on applying AI technology to specific areas such as unmanned retail and medical diagnosis. Chinese AI startups overtook their US counterparts by raising nearly US$ 5 billion in venture capital funding in 2017. The Chinese companies also filed the largest number of domestic AI related patents, more than 7 times than Silicon Valley.

China's AI industry has attracted the most financing and accounting for 60 per cent of all global AI investment from 2013 to the first quarter of 2018, according to a July report of Tsinghua university The Tsinghua report says that China has about 8.9 per cent of the world's total AI pool, compared with 13.9 per cent in the US but also finds that the country has one fifth of the "top tier" that the US has, US is still the lead in high quality innovation and research.

The US has now seized on the 'Make in China 2025" plan as an example of what it sees as unfair state intervention in Chinas economy. But is China really biting at the heels of the US as an AI superpower? The Oxford Future for Humanity Institute said in the report that except for "access to data" China trails the US in three core areas of AI growth: hardware, research and algorithm development, and commercialization of the industry. As far as in-depth applications are concerned such as identification of micro expressions under computer vision or hardware related ones, the US is still considerably ahead. China will therefore like to work with USA for some more time to plug the gaps in this field but the US establishment is getting wary of Chinese technology theft (SCMP 2018b).

China, meanwhile, has rid itself of the 'copycat" stigma and has emerged as a global innovation hub in business. In 2017, the internet and technology sector- ranging from ride hailing to e commerce, robotics and artificial intelligence grew at 18 per cent, substantially outpacing the overall economy which grew at 6.9 per cent. China is bent on building the world's largest innovation economy and its Greater Bay area which comprises Hong Kong, Macau and nine cities in Guangdong, is shaping up like a large Silicon Valley, due to its size, policy support, and innovation competitiveness. The Chinese are fully embracing new and emerging technologies like artificial intelligence, the internet of things and block chain as well as 5G, to further enable innovations. Governments at both central and local levels, as well as the private sector, are investing significantly in revolutionary fields. These technology breakthroughs will enable a higher level of automation, connectivity and intelligence, as well as more game changing business models.

Around 450 block chain technology companies have been registered in China, according to the Ministry of Industry and Information Technology. The regulatory attitude has turned from skepticism to acceptance and now encouragement.

In the field of digitization, China has established a vast array of technology startups, established huge platforms for e commerce, ride hailing, bike rentals and co working spaces. However, there is still a lack of digital vision, needs to be anchored in value generation and needs be multi-dimensional. The real driving force towards creating a digital economy therefore is still the US and specifically Silicon Valley (Liu 2018).

In the automotive sector, innovations in new energy vehicles are gaining speed, in addition to autonomous driving and "mobility as a service' which aims to reshape how city dwellers get around. Traditional carmakers, both foreign and local, are trying to reposition themselves as future new energy vehicles makers, while competing or collaborating with dozens of new, non-state-owned players, such as Nio, which was recently listed on the New York stock exchange.

Beijing earmarked 51.61-billion-yuan last year or local Make in China 2025 plans. In their quest for these funds, many provincial and municipal authorities have dusted off their regional industrial development blueprints and rebranded the strategies and subsidies as Made in China 2025 ones, according to a report

released on line on May 30 by the National Manufacturing Strategy Advisory Committee. The report said there was too much focus on the need for "governmental guidance' and fiscal subsidies. The lacks of overall coordination, according to the report raised the danger of exacerbating a problem of excess capacity. Shang Jin Wei, a finance Professor with Columbia University says that China's industrial subsidy policies are not particularly effective, and it is likely the authorities may miss the mark on many of these targets (SCMP 2018c).

When the 2025 blue print was devised it was with the apparent belief that it would be 'business as usual" – which meant China would continue to acquire overseas companies without much pushback, and trade foreign technology for access to its market. Alarm bells have become louder – both in the US and Europe making it that much difficult now for China to legally acquire the foreign technology needed to reach its 2025 targets (Addison 2018*)*.

With Mergers and Acquisitions involving China under a cloud, Beijing has only two options to achieve its 2025 targets; technology transfers and original research and development. The first option – technology transfers – whether 'forced' or done willingly for access to the Chinese market, is also unlikely to work out in time for the 2025 localization targets as western tech companies have their guard up. In fact, in the short term, china's reliance on core foreign technology is likely to increase as it upgrades its manufacturing lines with overseas partners. That only leaves original R&D, but the country's record in fundamental research is weak – one Chinese expert cited a "lack of scientific spirit" as the main reason – although there are some R&D champions such as the state backed chip giant Tsinghua Unigroup which claims to spend a hefty 30 per cent of revenue on R&D and telecoms maker Huawei Technologies with a ratio of 15 per cent. Chinese chip makers, flush with money from the state backed integrated circuit Fund have also accelerated recruitment of engineers from Taiwan, especially targeting Taiwan Semiconductor manufacturing company, which accounts for more than half of global semiconductor wafer foundry reserves.

A study by the Mercator Institute concluded that while the most ambitious "Made in China 2025" goal of a broad and economy wide upgrading of industry by the stated deadline will 'very likely not be reached due to weaknesses in the design and implementation of the policy' it did note that the plan 'will elevate a small but powerful group of Chinese manufacturers, dramatically increasing their competitiveness' it is just as well that the Chinese media is downplaying "Made in China 2025". While this didn't work as a strategy to ease US-China trade relations, it may turn out to be a handy face-saving move when the localization targets miss their deadlines *(*Addison 2018).

Inspired by Germany's industry 4.0 "Made in China 2025's" chances of success are uncertain at best. Unlike Germany, China does not have an effective banking system supportive of private companies with long term financing. The country also lacks the business culture of quality, precision and long-term orientation. With a poor track record in industrial targeting, Beijing's financial support is just as likely to be wastefully dissipated as productively channeled. Even if successful, Made in China 2025 can only make China better at incremental innovations, like Germany, while the US remains the unrivalled leader in the foreseeable future (Winston Mock 2018).

In conclusion, despite missing the deadline of 2025, and the US-China trade war notwithstanding, China will emerge as a larger and more capable innovative economy, China will be in the front seat, witnessing the turning point into the fourth industrial revolution, perhaps ahead of most, but not all other countries. As in the past, China will be tactical, nimble and devious. On the surface, China may seem to be responding to US demands, while it is actually reallocating government support to other schemes. Innovation has become and will continue to be a global, prevailing theme, and a country's future well-being hinges on its willingness and ability to embrace this trend. If "Made in China 2025" were a car, the engine has started and it is definitely moving along, with a clear direction. ■

REFERENCES

Addison, Craig. 2018. 'Why the Made in China 2025 roadmap to hi tech supremacy will miss its deadline', *South China Morning Post,* 2 October.

Gateway House. 2018. 'China's Disquieting FDI in hi tech', 5 July.

Liu, Jun. 2018. 'China's Digitization Needs Clear Vision to Succeed', 24 November, *South China Morning Post*.

Mock, Winston. 2018. '"Made in China 2025: Is only following the path beaten by the US and its allies', 12 October, *South China Morning Post*.

South China Morning Post. 2018a. 'Why "Made in China 2025" incurred the wrath of President Trump', 11 September, *South China Morning Post*.

South China Morning Post. 2018b. 'Made in China 2025: China has a competitive AI game plan but success will need cooperation', 2 October 2018, *South China Morning Post.*

South China Morning Post. 2018c. 'Is Beijing going Back to the Future with its much Hyped "Made in China 2025" Plan?', 5 September, *South China Morning Post*.

Shen, Jian. 2018. 'Why Made in China 2025 Should Scare Donald Trump Less than those Betting on Chinese Technology Dominance', 27 June, South China Morning Post.

The Economist. 2018. 'Chip Wars', 5 December.

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Issue No/ Month	Title	Author
No:74| Feb 2019	The Illusion of Universal Health Care: Medical Insurance as the Panacea	Madhurima Nundy
No:73| Jan 2019	Science, Technology and Innovation in China: Lessons for India	V S Ramamurthy
No:72| Jan 2019	India and China in the New Situation	Shivshankar Menon
No:71| Jan 2019	China-Vatican Deal: Determining Factors and its Implications	Navreet Kaur Kullar
No:70| Dec 2018	T-TIP and the EU-China Strategic Partnership	Preksha Shree Chhetr
No:69| Dec 2018	Emerging Cities of Amaravati and Xiong'an: Redefining Urbanization?	Ramya Kannan
No:68| Dec 2018	A Componential Analysis of the Impact of a Trade War on China's Economic Growth	Uday Khanapurkar
No:67| Oct 2018	Non-Standard Employment and Precarity: Student-Workers in China	P K Anand
No:66| Oct 2018	CPC Disciplinary 'Punishment' Regulations in the New Era	Bhim B Subba
No:65| Sep 2018	Abe's Re-election as the Liberal Democratic Party President: Analysing the Process, Outcomes and Challenges Ahead	Shamshad Khan

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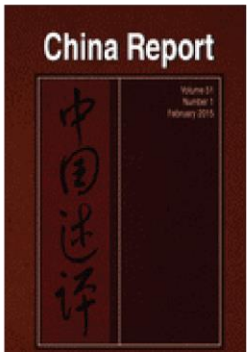

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