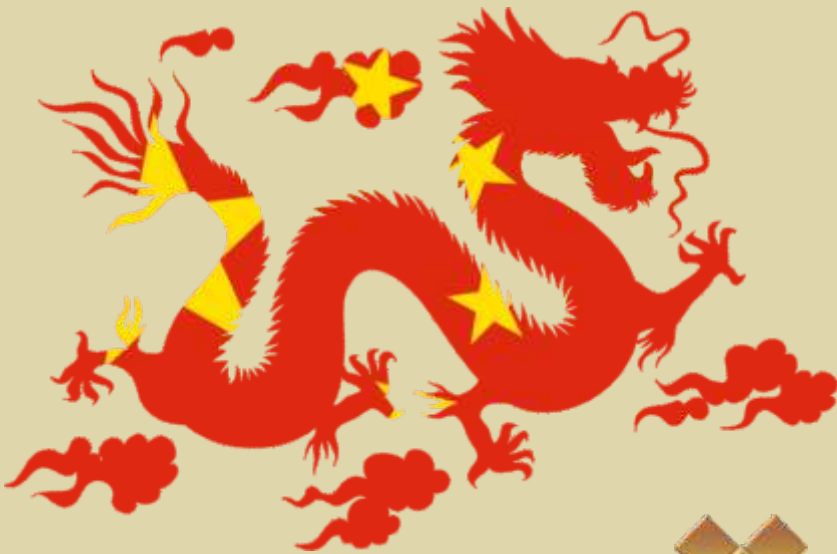


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Rise of China History, Technology & Policies

Implications for India

Maj Gen P K Mallick, VSM (Retd.)



Vivekananda International
Foundation

Rise of China, History, Technology & Policies: Implications for India

Maj Gen P K Mallick, VSM (Retd)

Consultant, VIF





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Vivekananda International Foundation
3, San Martin Marg, Chanakyapuri, New Delhi - 110021
Tel: 011-24121764, Fax: 011-66173415
E-mail: info@vifindia.org, Website: www.vifindia.org

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Foreword

A lot has been written on the rise of China from different angles. Given the complicated history of Sino-Indian relations, it is important to understand the implications of China's rise for India and the region. It is important to realize that technology will be a major driver of China's rise in the future. The eruption of a trade war between the US and China is a reflection of the acute struggle between the two economic giant for technological supremacy. While the US remains ahead of China in the competition of technologies, China is trying its best to catch-up.

In this monograph, Major General PK Mallick (Retd) traces the history of rise of China and critically examines China's ambitious plan 'Made in China-2025' which relies upon achieving self-reliance in many key technologies. Can China become a true innovator or will it remain caught up in the catch-up exercise? This is an open question. The author makes a comparison of India and China on economic and technological parameters, and the growing Chinese involvement in the Indian economy. The author concludes that despite China's best efforts, it is unlikely to become a global leader in technology and innovation any time soon. He also feels that despite the various problems in Sino-Indian relations, India should take advantage of US-China trade war, attract Foreign Direct Investment from China and collaborate with it in emerging technological areas.

The monograph has lots of data and charts. It is our hope that it will be found useful by lay readers as well as experts.

New Delhi
Aug 2019

Dr Arvind Gupta
Director, VIF

Chapter – 1: Introduction

China was the world's largest economy in 1820, accounting for an estimated 32.9 percent of global gross domestic product (GDP). But foreign and civil wars, internal strife, weak and ineffective governments, natural and manmade disasters and distortive economic policies caused China to fall behind. China's policies kept the economy poor, stagnant, centrally controlled, vastly inefficient and relatively isolated from the global economy. By 1952, China's share of global GDP had fallen to 5.2 percent, and by 1978, it slid to 4.9 percent. After the death of the founder of modern China, Chairman Mao Zedong, China began to open its economy. Adoption of economic reforms by China in the late 1970s led to a surge in China's economic growth and helped restore China as a major global economic power.¹

Since opening up to foreign trade and investment and implementing free market reforms in 1979, China has become the world's fastest growing economy, with real annual (GDP) growth averaging 9.5 percent through 2017. The World Bank described the pace of growth as "the fastest sustained expansion by a major economy in history." Such growth has enabled China, on average, to double its GDP every eight years and helped raise an estimated 800 million people out of poverty. China has become the world's largest economy on a purchasing power parity basis and a manufacturer, merchandise

trader and holder of foreign exchange reserves. China is the largest foreign holder of US Treasury securities, which help fund the federal debt and keep US interest rates low. China is a considerable player on a global stage—and the strategic choices it makes could be pivotal for global growth.

China is the major commercial partner of the US. China is:

- The largest US merchandise trading partner.
- Biggest source of imports.
- Third largest US export market.
- Largest foreign holder of US Treasury securities, which help fund the federal debt and keep US interest rates low.

Since 1978, China has transformed itself from a predominantly agricultural economy into a manufacturing powerhouse. China has impressive achievements in agriculture. Today China is one of the world's largest producers of cereals, meat and vegetables, which has enabled it to feed 22 percent of the world's population with merely 7 percent of the arable land. China's progress in autonomous and electric vehicles, microchips, nuclear power, high voltage grids, space exploration, quantum computing and communications and gene editing are extremely impressive.² As one recent report succinctly summarized this metamorphosis, "China has become the world's largest development bank. The China Development Bank and the Export-Import Bank of China now provide as much financing to developing countries as the World Bank does."³

In 1972 President Richard Nixon visited China and it was the beginning of a new era. Every US presidential administration has done more than any other power to contribute to China's

modernization. It has drawn China into the global economy, given the Chinese access to markets, capital and technology, trained Chinese experts in science, technology and international law, prevented the full remilitarization of Japan, maintained the peace on the Korean Peninsula and helped avoid a war over Taiwan. ‘Made in China 2025’, published in summer 2015, laid out how and why China would need to move up the technology ladder and close the gap with developed countries in higher end or intelligent manufacturing. The plan identified 10 key sectors and set out targets to raise domestic content in core components and materials. In a report released last year, the US Trade Representative argued that the US had indeed “erred in supporting China’s entry into the WTO on terms that have proven to be ineffective in securing China’s embrace of an open, market oriented trade regime.”

When a great power like China rises, established super powers, faced with challengers, tend to become fearful, insecure and defensive. Rising powers feel a growing sense of entitlement and demand greater influence and respect. In such an environment, misunderstandings are magnified, empathy remains elusive and events and third party actions that would otherwise be inconsequential or manageable can trigger wars that the primary players never wanted to fight. Such shifts so often lead to conflict and into a Thucydides’ trap, named after the ancient Greek historian who observed a dangerous dynamic between a rising Athens and ruling Sparta. According to Thucydides, “It was the rise of Athens and the fear that this instilled in Sparta that made war inevitable.”

In December 2017 and January 2018, the US Government published two important documents - the National Security Strategy (NSS) and the National Defense Strategy (NDS) respectively. In both documents,

Beijing is seen as a near existential threat to the United States and the West in general. These documents call for a fundamental shift in the US approach to security, emphasizing competition against Russia and China at the expense of eradicating transnational terrorism. Both documents portray China as a “revisionist” power seeking to overturn the US led “free” world order.⁴ The US imported \$505.469 billion worth of goods from China in 2017 and exported nearly \$129.89 billion worth of goods to China. There was trade deficit of around \$375.23 billion. On January 2018, The United States – based on the decision of President Trump – began imposing high tariffs. China took some retaliatory measures. The trade war continues till date.⁵

Both India and China had long periods of stagnation under their respective forms of government. In 1960, China’s total merchandise and services trade was equivalent to only 9 percent of the nation’s GDP. India was slightly better at around 11 percent of GDP. In 1978, China’s GDP was \$149 billion, just 1.75 percent of global GDP. China’s GDP that year was about the same size as India’s then \$140 billion. China’s per capita GDP was \$156, even less than India’s \$203. 40 years down the line to 2018: China’s economy is \$12.2 trillion, accounting for 15 percent of global GDP and nearly five times India’s. Its per capita income is \$8,825, over four times India’s \$1,939. China is to surpass the US by 2030. China is way ahead of India in terms of technology in IT and telecom space. India has miles to go before it seriously challenges Chinese leadership in technology and economy.

India started integrating its economy with the world after about 13 years since China did. Adversely affected by a major foreign currency crisis, India began liberalizing its economy in 1991. Foreign investment was welcomed in a growing number of sectors

and customs duty rates were steadily reduced. India's current GDP growth rate of an estimated 7.5 percent in 2018 has overtaken China's – estimated figure of 6.5 percent. But India adds just a fraction of what China adds to its GDP each year. China's economic base is so huge that Beijing can still add far more to its economy than New Delhi even with a lower growth rate. India, to add as much to its GDP as China, will in 2018 it needs to grow by a staggering 40 percent. China added \$1.2 trillion in additional demand last year — or half the size of India's economy. Even if China grows at zero per cent, India will have to grow at 10 per cent annually for the next 20 years to catch up.

In view of the current trade war between USA and China there has been number of opportunities and challenges for India to develop its economy. This Monograph provides background on China's economic rise, explains its current economic structure, identifies the challenges China faces to maintain economic growth, measures taken by China to take the lead in technology arena like the Made in China 2025 and its present status, and finally, China-India trade relations. The Monograph also discusses the challenges, opportunities and implications of China's economic rise for India.

Chapter – 2: Rise of China

Rising Super Power

China has emerged as a great power throwing a challenge to the only super power USA. Across any metrics by which great power status is defined, China is the only country besides the US that equates with that great power status. Factors that helped China to be the global power are: population size, size and growth rate of its economy and the percentage share of global trade and the mass and strength of its military. China is the only country who can pose a threat to US dominance of the world order.

China has 14 neighbouring countries. Only Russia has similar contiguous neighbours. Out of these, China has fought wars in the past 70 years with India, Japan, Russia, South Korea and Vietnam. None of China's neighbours perceive its core national interests as congruent with China's. China's rise has led to fears that the country will soon overwhelm its neighbours. During the next few decades if China's economic, military and geo-political influence continues to rise at a most conservative pace, the world will witness the largest shift in the global distribution of power since the rise of the US. As expected, if China surpasses the United States as the world's largest economy in the next 10 to 15 years, it will mark the first time in centuries that the world's economic leader will be non-English speaking, non-Western and non-democratic. There will be natural

frictions and competition between the rising power and the U.S; the competition, which can spur innovation should not be allowed to spiral into military conflict.

In the last 25 years, the US' China strategy assumed that expanding flows of trade and investment between the two countries would be good for the US economy and help in evolution of its economic policy and domestic political system of China. It was expected that gradually China would move away from state directed planning, abandon its interventionist and protectionist practices, strengthen the rule of law and place greater reliance on market mechanisms. Economic growth and the emergence of a new middle class in China would give rise to inevitable demands for democratizing political reforms.⁶ Global issues like climate change can be addressed effectively by these two great powers.

Since 1979, China has invested heavily in infrastructure, education, technology acquisitions, research and supportive business policies to produce incredible economic growth. Western companies took advantage of the Chinese market. However, the Chinese government used espionage, intellectual property (IP) theft, coercive joint venture requirements, trade barriers and aggressive mercantilist policies to achieve their goals. Today China is the world's largest creditor nation and the US its largest debtor nation.

Economic Reforms

I - China's Economy Prior to Reforms of 1979

Under the leadership of Chairman Mao Zedong, China maintained a centrally planned economy. A large share of the country's economic

output was controlled by the state. The state would set production goals, controlled prices and allocated resources. During the 1950s, all of China's individual household farms were collectivized into large communes. The central government undertook large scale investments in physical and human capital during the 1960s and 1970s to support rapid industrialization. By 1978, nearly three fourths of industrial production was produced by centrally controlled, State Owned Enterprises (SOEs), Private enterprises and foreign invested firms were barred. The goal of the Chinese government was to make China's economy relatively self-sufficient. Foreign trade was limited to obtaining those goods that could not be made or obtained in China.

During the leadership of Chairman Mao Zedong, China's economy suffered significant economic downturns. The Great Leap Forward from 1958 to 1962 led to a massive famine and reportedly deaths of up to 45 million people and the Cultural Revolution from 1966 to 1976 caused widespread political chaos and greatly disrupted the economy.

II - The Introduction of Economic Reforms in 1978

Shortly after the death of Chairman Mao in 1976, the Chinese government decided to break with its Soviet style economic policies by gradually reforming the economy according to free market principles and opening up trade and investment with the West, in the hope that this would significantly increase economic growth and raise living standards. Chinese leader Deng Xiaoping, the architect of China's economic reforms, said famously: "Black cat, white cat, what does it matter what color the cat is as long as it catches mice?"

III - 1978–91

The economic reforms began with Deng's consolidation of power in December 1978 and lasted until the end of the Cold War in December 1991. It laid the foundation for China's resurgence as a global power. Chinese grand strategy, was oriented toward acquisition of comprehensive national power. China launched several economic reforms. The central government initiated large number of initiatives like:-

- Price and ownership incentives for farmers, which enabled them to sell a portion of their crops on the free market.
- Establishment of four special economic zones along the coast for the purpose of attracting foreign investment, boosting exports and importing high technology products into China.
- Coastal regions and cities were designated as open cities and development zones, which allowed them to experiment with free market reforms and to offer tax and trade incentives to attract foreign investment.
- Decentralize economic policymaking in several sectors, especially trade.
- Citizens were encouraged to start their own businesses.
- State price controls on a wide range of products were gradually eliminated.

Trade liberalization was a major key to China's economic success. Removing trade barriers encouraged greater competition and attracted Foreign Direct Investment (FDI) inflows. China's gradual

implementation of economic reforms sought to identify which policies produced favorable economic outcomes and which did not so that they could be implemented in other parts of the country, a process Deng Xiaoping reportedly referred to as “crossing the river by touching the stones.” Deng’s internal reforms focused on rebuilding Chinese power through the “four modernizations” intended to transform China’s agriculture, industry, science and technology and the military in that order.

During the early phase of Deng’s reforms, the Soviet Union remained the biggest national security threat to China. President Richard Nixon’s historic visit to Beijing in 1972, permitted China for the first time to tacitly ally with the United States to keep its northern rival in check. By following the “24 character strategy”—“Observe calmly; secure our position; cope with affairs calmly; hide our capacities and bide our time; be good at maintaining a low profile; and never claim leadership”—Deng consciously sought to create the political space that would allow China to pursue its internal economic modernization without the distraction of external entanglements.⁷ By the time the Berlin Wall fell, China had fully emerged from the Mao era and, for over ten years, had been pursuing a new economic model which Deng Xiaoping had called “socialism with Chinese characteristics.” In the process, the Chinese state had relinquished a significant degree of direct control over the economy and introduced many of the features of a market system.

Deng was firmly of the view that China must “hide” power and “bide” its time so as not to unnerve its neighbors while building up national power. It should refuse to “claim leadership” that would force it to make hard choices that could alienate bystanders and competitors. Deng did not shy away from using force against his own people at

Tiananmen Square in 1989. Faced with thousands of young Chinese protesting corruption and yearning for greater political freedoms, he ordered the People's Liberation Army (PLA) to violently suppress the uprising.

IV - 1991–2008

Since Deng Xiaoping's reforms China faced number of challenges. Deng sidelined conservatives to usher in the economic opening up of the early 1990s. In 1998, China weathered the Asian financial crisis. China, in the wake of the 2008 Olympics, emerged even stronger, increasingly convinced of the inevitability of its rise and the decline of the West. By the end of the 1990s, China was aggressively pursuing admission to the WTO; that hinged on being granted Permanent Normal Trade Relations (PNTR) with the United States. Richard Nixon earlier warned that the US would be imprudent "to leave China forever outside the family of nations, there to nurture its fantasies, cherish its hates and threaten its neighbors. There is no place on this small planet for a billion of its potentially most able people to live in angry isolation."⁸

The Clinton Administration supported that change and Congress approved it in May of 2000. There were vigorous oppositions, but the general view was that if the Chinese Communist Party (CCP) wanted China to grow economically, it would have to pursue further economic liberalization and continue the progress towards a market based system. It was believed that economic liberalization in China would lead to greater political freedom in the country and full participation in the world trading system would make China a responsible player in the broader international order. The United States had integrated the war torn economies of Germany and Japan into the international

order after the Second World War. These countries were democratic allies and did not acquire military capabilities to threaten the United States. China is neither a democratic regime nor a US ally. China is a competitor that seeks to displace the United States as the principal security provider in Asia, while replacing it globally as the most important power in the international system.⁹ Once the Communist threat receded and inter capitalist competition intensified, USA began to use its global weight to assert American national interests. President Reagan strong armed Germany and Japan to revalue their currencies to give US exporters an extra edge. The World Bank and IMF were used to prise open crisis stricken economies and put their assets up for sale.

China was following Deng Xiaoping's words: 'Maintain a low profile, hide brightness, do not seek leadership, but do same things'. However, China did follow USA's line in many occasions. Examples are: the disastrous invasion of Vietnam in 1979, dispatch of Uighurs to support the American backed Mujahideen in Afghanistan, joining the US in sanctions against North Korea, cast its UN Security Council vote in favour of the occupation of Iraq and the bombardment of Libya.

The US policy towards China was very clear. The guidelines set out in its 1993 National Security Strategy were followed consistently. The strategic priority for the US after the Cold War was:-

- To prevent the emergence of a new superpower.
- Maintain the unchallenged aerial and naval supremacy over the Pacific region that it had enjoyed since 1945.
- Watch China closely and 'support, contain or balance' as need be.

US pressurised China to implement the structural reforms spelled out by the World Bank to open its markets fully to western firms and investors and guarantee their property rights. USA hoped that socializing Chinese elites within its university system would help to produce a new layer of Yeltsins and Gorbachevs, open to the idea of replacing the Chinese Communist Party (CCP) with a more acceptable form of rule. But US' expectations on China did not materialize. China has succeeded in using the world trading system to its advantage. China developed a comprehensive set of policies that enabled it to enjoy the benefits of the system while evading many of its obligations. These include:-

- Massive subsidies to Chinese firms in key sectors that lower the cost of doing business and enable them to control domestic markets and capture markets abroad.
- Forced technology transfer as a condition of doing business in China.
- Regulatory discrimination against foreign firms.
- Subterfuges to avoid Beijing's commitments to liberalize its import regime.
- Foreign investment restrictions to keep out competition.
- Enormous theft of vital technology.

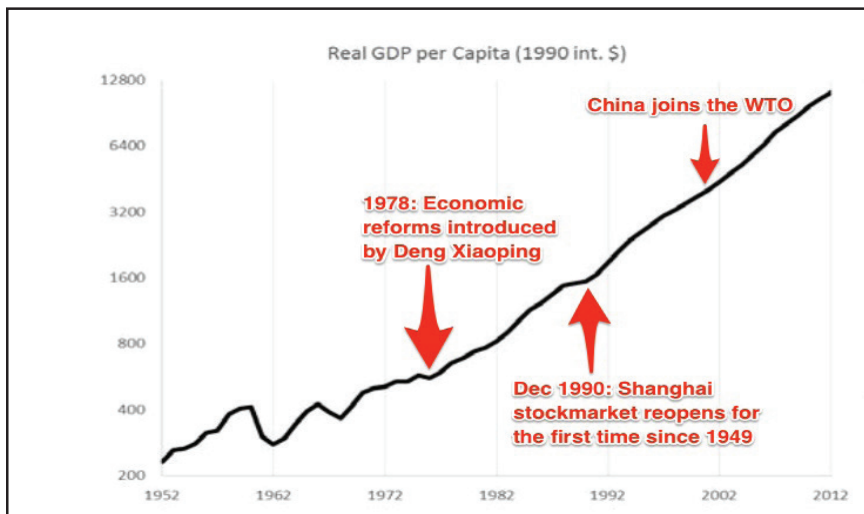
V - 2008–Present

Up to the mid-2000s, China's economic development strategy sought principally to induce foreign multinationals to shift relatively low and

moderate value production to China. It used an array of unfair tactics, including currency manipulation, massive subsidies and limits on imports.¹⁰ However, that strategy changed in 2006 as China moved to a 'China Inc.' development model of indigenous innovation which focused on helping Chinese firms, especially those in advanced, innovation based industries, often at the expense of foreign firms. Marking the shift was a seminal document called the 'National Medium and Long term Program for Science and Technology Development (2006-2020)', which called on China to master 402 core technologies, everything from intelligent automobiles to integrated circuits and high performance computers.¹¹

VI - Major Challenges Facing the Chinese Economy

As China's economy matured, its real GDP growth slowed down from 14.2 percent in 2007 to 6.9 percent in 2017. The International Monetary Fund (IMF) projected that GDP growth of China will fall



Source: ¹²

to 5.8 percent by 2022. Policies that were employed in the past to essentially produce rapid economic growth at any cost were very successful. Such policies have entailed a number of costs in heavy pollution, widening income inequality, overcapacity in many industries, an inefficient financial system, rising corporate debt and numerous imbalances in the economy. The old growth model is viewed by many economists as no longer sustainable.

China is currently undergoing a major restructuring of its economic model. China has sought to develop a new growth model (“the new normal”) that promotes more sustainable (and less costly) economic growth that puts greater emphasis on private consumption and innovation as the new drivers of the Chinese economy. Implementing a new growth model that sustains healthy economic growth could prove challenging unless China is able to effectively implement new economic reforms. Such reforms are required for China to avoid hitting the ‘middle income trap’, when countries achieve a certain economic level but begin to experience sharply diminishing economic growth rates. The post-Cold War period until the 2008 global financial crisis, witnessed the steady exhibition of rising Chinese power that made Deng’s hide and bide policy dated. The financial crisis, made Chinese leaders believe that US primacy was finally ebbing and it is time to claim leadership on the global stage. Once China found itself facing the United States in the new bipolar era, its economic, military and geopolitical trajectory took the country towards greater investments in protecting its security regionally and expanding its influence globally.

In the last few years, though, the focus of China’s efforts have shifted. In 2015, Chinese President Xi Jinping confidently announced the goal

of making China the “master of its own technologies”. China’s arrival at the world stage resulted from the evolution of Chinese economic policy over the past two decades. China wants to establish greater influence around the world with governments, academia, media to advance china’s objectives. Xi Jinping assumed extraordinary powers opening the door for his continuation in office indefinitely. Xi Jinping’s efforts to claim global leadership and sustained economic growth has been complemented by a comprehensive military modernization program befitting an emerging superpower. The transformation is directed toward acquiring the most sophisticated military weapons. The strategic nuclear forces, space, cyber and electronic warfare components are being modernized extensively.

The election of Donald Trump, changed the situation dramatically. Trump administration declared that the era of great power competition had returned and that China, along with Russia, was in fact a strategic competitor of the United States.¹³ Today, USA is in the middle of a tariff war and instructing NATO members to boycott China’s market leading 5G technology. The US National Security Strategy classifies China, alongside Russia, as a ‘revisionist power’. The NSS document says: “China aimed to displace the US from the Western Pacific and reorder the region to suit itself. We assumed that our military superiority was guaranteed and that a democratic peace was inevitable. We believed that liberal democratic enlargement and inclusion would fundamentally alter the nature of international relations and that competition would give way to peaceful cooperation.’ Instead, a new era of ‘great power competition’ has dawned, involving a systemic clash ‘between free and repressive visions of world order.”¹⁴

The Trump administration has identified the following key issues:-

- **Insufficient access to the Chinese market for exporters and investors.** ‘Made in China 2025’, focus on import substitution by creating specific targets for displacing foreign technologies. As part of its One Belt, One Road project, China is pressing participating countries to buy Chinese high speed trains, solar panels and telecommunications equipment, which could reduce opportunities for American businesses beyond China.
- **Intellectual Property.** China imposes long delays before awarding rights for foreign patents, copyrights and trademarks, insists on unfair licensing terms, demands that companies transfer technologies to Chinese firms in exchange for market access, buys foreign technology with public money and sometimes steals foreign commercial secrets without inhibition.
- **Overcapacity.** China’s state backed financing and other policy incentives regularly attract waves of corporate investment that far outstrip reasonable expectations of market demand. This results in a fall in prices and profitability. This has happened in construction industries of steel and cement, high-tech sectors like solar panels and wind turbines and electric cars.
- **Poor Governance of Data.** China collects, processes and use data of all kinds on a massive scale. It puts huge constraints on the ways multinational companies use data and on cross border data flows. This affects businesses

and consumers that rely on global data, e commerce and other online services and the development of artificial intelligence applications.

Demise of Soviet Russia

With the dissolution of the Soviet Union in 1991 China realised the following:-

- China's most immediate security threat from its longest and most vulnerable northern border was removed. This permitted China to shift its strategic gaze toward its maritime frontiers.
- Reminded of both the brittleness of authoritarian regimes and the perils of possessing a weak economy. The Chinese leadership spent the first few years after 1991 thinking seriously about what must be done to avoid a similar crisis from engulfing China.
- United States was the victor of the Cold War. With the Soviet Union now out of the way, China had to prepare to face the United States largely alone.
- The debacle at Tiananmen Square reminded Chinese leaders the problems of legitimacy. Although economic reforms had increased prosperity, the corruption, social dislocation and personal grievances had to be addressed.

The Communist Party of China (CPC) analysed extensively the phenomenon of disintegration of Soviet Russia. Plenty of blame was apportioned to Mikhail Gorbachev, the reformist leader who was simply not ruthless enough to hold the Soviet Union together.

But Chinese leaders also highlighted other important factors - Soviet leaders made the mistake of getting drawn into a costly and unwinnable arms race with the United States and fell victim to imperial overreach, throwing money and resources at regimes with little strategic value and long track records of chronic economic mismanagement. As China enters a 'new cold war' with the US, the CPC seems to be at risk of repeating the same mistakes.

According to the Stockholm International Peace Research Institute, China spent some \$228 billion on its military last year. China's budget for internal security is also huge. China's economy is not equipped to generate sufficient resources to support this level of spending. During the Cold War with the Soviet Union it was isolated. China is not isolated. Its economy is intertwined with many countries.

Innovation

The Chinese government has made innovation a top priority in its economic planning through a number of high profile initiatives, such as 'Made in China 2025', China took the following steps for up gradation of technology sector:-

- **Attract foreign investment.** Induce foreign multinationals to shift relatively low and moderate value production to China in early days.
- **Attempt to learn from foreign companies.** By having them train Chinese executives, scientist and engineers and by forced technology transfer.
- **Support Chinese companies in their efforts to copy and incorporate foreign technology while building**

up domestic capabilities. 2006 publication of “National Medium and Long term Program for Science and Technology Development (2006–2020),” called on China to master 402 core technologies—everything from intelligent automobiles to integrated circuits and high performance computers. China moved to a ‘China Inc.’ development model of indigenous innovation, which focused on helping Chinese firms, especially those in advanced, innovation based industries, often at the expense of foreign firms.

- **Enable Chinese firms to be independent innovators.** China is attempting to become like Japan, Singapore, South Korea and Taiwan through an array of plans and policies. For ICT enabled manufacturing, the strategy calls for 80 percent domestic market share of high end computer numeric controlled machines by 2025; 70 percent for robots and robot core components; 60 percent for big data; 60 percent for IT for smart manufacturing; and 50 percent for industrial software. While China is close in some areas such as telecommunications equipment, it is much farther away in others such as biotechnology and semiconductors.

In their book, ‘Created in China: How China is Becoming a Global Innovator’, Georges Haour and von Zedtwitz wrote, “China is fast transitioning from low cost manufacturing to a higher value, innovation led economy.”¹⁵ In China’s Next Strategic Advantage: From Imitation to Innovation, George Yip and Bruce McKern argued, “Chinese companies are much more successful at innovation than previously thought.”¹⁶

China has impressive results in innovation which are globally competitive. Some of them are:-¹⁷

- **Supercomputers.** The National Supercomputing Center in Wuxi, China, unveiled the Sunway TaihuLight in 2016, the world's fastest supercomputer.
- **Artificial Intelligence (AI).** Gregory C. Allen, a fellow at the Center for a New American Security, wrote that China's dominance of artificial intelligence technology and its military applications are not only credible, but likely, in the absence of a massive shift in US policy.
- **Engineering based innovation.** China has had much striking successes in commercial aviation, auto manufacturing, telecommunications equipment, flat panel displays and high speed rail. In 2016, China's high speed rail car producer CRRC had over two thirds of global deliveries. China BOE Technology Group is one of the most sophisticated producers of liquid crystal displays (LCDs).
- **Telecommunications equipment.** Huawei holds the largest share of the world's telecommunications equipment market at 28 percent. It invests over \$11.5 billion annually in R&D, ranking it fifth in the world.
- **Customer focused innovations, including industries such as Internet software and services, appliances and household products.** DJI (company) is the world's top drone maker, while Haier is the world's largest producer

of major appliances. Internet service companies such as Baidu, Alibaba and TenCent, are the fourth, fifth and sixth largest Internet companies in the world.

- **Efficiency driven innovation includes chemicals, textiles, electrical equipment and construction machinery.** Chinese chemical companies are expected to capture 40 percent of global market share by next year. Its construction equipment industry continues to grow in scope and sophistication. For example, Chinese company XCMG launched a 700 ton hydraulic excavator with intelligent monitoring and fault self diagnosis technology.
- **Science based innovation.** Critics argue that China is far behind in science based innovation. It is true that in fields like biopharmaceuticals and semiconductors China is lagging behind. But China is making rapid progress in this area. China has recently landed a vehicle on the dark side of the moon and broadcasted images back.

McKinsey & Company in their report on The China Effect on Global Innovation, October 2015 stated that China has made science based innovation a top priority and has invested in building the institutions and capabilities needed for discovery and invention. So far, these investments have not translated into innovation leadership, but they have created a strong foundation.¹⁸

There are doubters about Chinese innovation who profess the only real innovation is first of a kind, new to the world innovation.

The Apple iPhone was an innovation, but Samsung's Galaxy was not. Apple holds 18.2 percent of the global smartphone market, compared with Samsung's 18.7 percent. But the top three Chinese smartphone makers—Huawei, Xiaomi and Oppo—which together hold 32 percent of the global market. Innovation is not just about who is first, it is also about who gains global market share. The history of technology has shown time and again that fast followers and practitioners of reverse innovation can gain considerable market share. The nations that host them can gain a significant number of jobs and growth in income from this kind of innovation.

Chinese tech giants are investing aggressively in new businesses, helping to transform China into a massive market for venture capital investments. China has spawned a new generation of homegrown entrepreneurs who are creating world class products, developing their own technologies and rolling out new business models on a scale and with a speed the global economy has never seen. China is now among the world's top three markets globally for venture capital in digital technologies including virtual reality, autonomous vehicles, 3D printing, drones and artificial intelligence. According to McKinsey & Co about a third of the world's 262 "unicorns" (startups valued at more than a billion dollars) hail from China and account for 43 percent of the global value of such companies.

China now has a serious programme to attract its own researchers, skilled engineers and scientists back to the country. The thousand talents plan targets scientists below the age of 40 who have PhDs from prestigious foreign universities. The government offers 500,000 RMB (\$80,000) lump sum to everyone enrolled in the programme and promises research grants ranging from one to three million RMB

(\$150,000-\$300,000). The funding for the programme is growing. Individual Chinese universities are offering several times that sum. China is not depending totally on Chinese educated scientists and engineers. It is also paying very high salaries to recruit foreign engineers and scientists from nations such as Korea, Taiwan and the United States. Talents from Asian and other countries not getting visa from USA are happily going to China.

China's capacity for innovation has impressively kept pace with its other accomplishments. From starting out as a reproducer of technology developed elsewhere, China today can hold its own where developing advanced technologies indigenously. China's scientific publications, patenting activity and R&D expenditures, suggest that China is well positioned to make the transition from an industrial to a knowledge based economy in the future.

Great Power Status

Rising powers feel a growing sense of entitlement and demand greater influence and respect. Established powers, faced with challengers, tend to become fearful, insecure and defensive. United States and China have civilizational incompatibility between them. Tension is bound to rise between Huntington coined Western civilization of the United States and Chinese values, traditions and philosophies. Whenever the rising power like China, threatens to displace an established power like the United States there is bound to be friction. Like all great powers before it, China is utilizing the fruits of its expanding economic strength to alter the character of the global political system itself, with particular consequences for the distinctive unipolar status enjoyed by the United States since the

end of the Cold War. Today, America's preeminence is challenged by China. China has become the second power in the world and it wants to become the first. The United States is not disposed to see itself replaced in its position of leadership.

There is nothing unusual about this situation. Struggle for preeminence has been going on, since the Early Modern age. During the later Renaissance and religious wars periods it was Spain versus France. From the late seventeenth century to the end of the Napoleonic Wars it was France against England and then Britain. For much of the nineteenth century it was Britain against Russia. In the early twentieth century—Britain against Germany. In World War Two—the United States against Germany and Japan. During the Cold War, it was the United States against the Soviet Union. Today it is the United States versus China. This struggle is not necessarily destined to result in a direct war, although it might. After all, the Cold War did not result in war. But whatever the forms the Sino American competition is going to take, the stakes are incredibly high and not just for the two contesting powers.

Power is the ability to get other countries to do what you want. Today, China is already a huge industrial country. Its manufacturing sector is almost as big as those of the US, Japan and Germany together. It has enormous numbers of skilled people. The economy is also less dependent on trade than it used to be. Between 2005 and 2018, China invested around \$1,941.53 billion (USD) worldwide. In the same time frame, nominal Chinese military spending increased from \$76.6 billion (USD) to \$228.2 billion. China has managed to translate its economic growth into vast economic, political and military power on the world stage.

USA's greatest concerns about Chinese military capabilities are in those areas that require high end technology, areas in cyber, in space, in electronic warfare where the norms have not actually been established. Even if it is there it is not certain that the Chinese would adhere to those. As China's GDP continues to grow and even exceeds that of the United States, its per capita income will still lag considerably behind. But China will possess economic strength in sheer mass and compared with all other countries in the international system, will enjoy comprehensive power most closely approximating that of the United States. Under Xi, the international system will progressively shift from its current uni-polarity toward a new bipolarity.

China's disadvantages are:-

- Its economy has been smaller than USA.
- Its system and values are generally less attractive than those of the United States.
- China does not have allies or even the long standing relationships that the United States has around the world.
- Its military is greatly inferior to that of the United States in power projection capabilities.
- China entered an international order in which the United States wielded a disproportionate degree of influence.

China has managed to make relative power gains from its weaker position over the past 20 years. China has taken part in activities in places where the competition among states was the weakest like

peacekeeping and infrastructure development as a key component of economic aid and engagement with specific countries in Africa, Latin America and Asia that had a weak US presence.

China's Approach to Building Political Power

The United States set up international institutions to facilitate the promotion of structures, norms, principles and values that support US power and reduce the transaction costs of diplomacy, making it easier for the United States to exercise its power. China avoided international institutions during the Cold War and criticized them as tools of US hegemonic power. In the 1990s, Chinese leaders realized that it would be to their benefit to become less isolated economically and politically. Hence China joined almost all of the existing institutions. The United States supported this change. China benefits greatly from this arrangement. As a member of the permanent five with veto power, China has gained significant power over international security from its participation in the United Nations Security Council. As of April 2018, the World Bank had lent China more than \$60.495 trillion for 416 projects on domestic growth in transportation, urban development, rural development, water resources management, energy and the environment. China's accession to the World Trade Organization (WTO) expanded China's access to foreign markets, leading to a surge in exports that fueled its impressive economic growth.

The Thucydides Trap. In the long history of the world when a country rises to challenge the existing sole superpower in most cases it has resulted in war. The reason such shifts so often lead to conflict is Thucydides' trap, named after the ancient Greek historian who

observed a dangerous dynamic between a rising Athens and ruling Sparta. According to Thucydides, “It was the rise of Athens and the fear that this instilled in Sparta, that made war inevitable.” Graham Allison of Harvard says there have been 16 such junctures in the history of the world starting with the rise of Athens, which rose up to challenge Sparta and in 12 of those 16 junctures the result was war.^{19,20}

Belt and Road Initiative (BRI) / One Belt One Road (OBOR)

China’s Belt and Road initiative (BRI), also called ‘One Belt, One Road’ (OBOR), was launched in 2013 to boost economic integration and connectivity such as infrastructure, trade and investment with its neighbours and various trading partners in Asia, Africa, Europe and beyond. At the APEC summit in November 2017, President Xi said that the Belt and Road Initiative calls for joint contribution and it has a clear focus, which is to promote infrastructure construction and connectivity, strengthen coordination on economic policies, enhance complementarities of development strategies and boost interconnected development to achieve common prosperity. This initiative is from China, but it belongs to the world. It is rooted in history, but it is oriented toward the future. It focuses on the Asian, European and African continents, but it is open to all partners. I am confident that the launch of the Belt and Road Initiative will create a broader and more dynamic platform for Asia-Pacific cooperation.²¹

China had built up huge amount of excess capacity in the construction, steel and engineering industries. It had to find new ways of being employed productively or be written off as barren assets. The BRI/

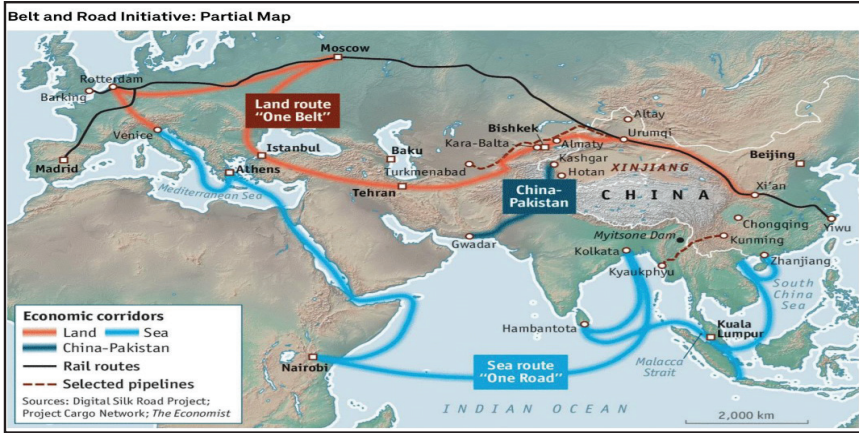


Image Source : ²²

OBOR aims to strengthen China's connectivity with the world. It combines new and old projects, covers an expansive geographic scope and includes efforts to strengthen hard infrastructure, soft infrastructure and cultural ties. At present, the plan extends to 65 countries with a combined Gross Domestic Product of \$23 trillion and includes some 4.4 billion people. The initiative could provide a big boost to China's economy and soft power image. China hopes to gain a better return on its foreign exchange reserves, create new overseas business opportunities for Chinese firms, create new markets for industries currently experiencing overcapacity and stimulate economic development in poorer regions of China. However, the initiative could pose financial risks if borrowers do not repay loans or if recipient countries do not view Belt and Road as benefiting them.

This initiative intended to link China westward across the Eurasian landmass to Europe through multiple routes, also includes a complementary maritime component that seeks to connect China

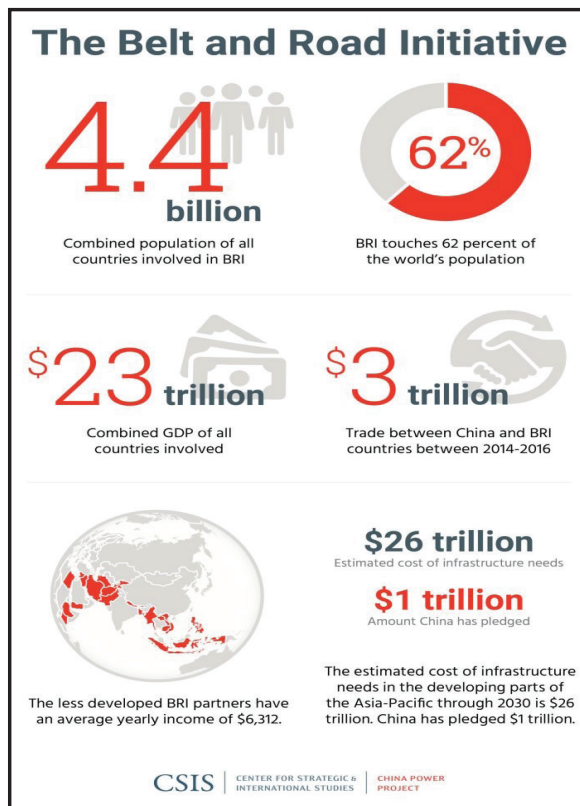
through Southeast and South Asia to East Africa, through the Suez Canal to Southern Europe and across the Pacific Ocean to Latin America. As China's economy has slowed some of China's State Owned Enterprise (SOE) – such as cement, steel and construction companies are struggling to find productive uses for their excess capacity and resources. China has a large reserve of savings that is not being invested productively. Investing in large scale overseas infrastructure projects enables China to export its excess savings and put its SOEs to work.²³

China will have considerable economic and political gains from the BRI. Some of these gains are:-

- Expansion of China's export markets.
- Promotion of the Renminbi (RMB) as an international currency and the reduction of trade frictions like tariffs and transport costs.
- Developing and connecting hard infrastructure with neighboring countries will help reduce transport times and costs.
- Establishing soft infrastructure with partner countries will allow for a broader range of goods to be traded with fewer regulatory hurdles.
- Raising capital for these infrastructure projects by issuing bonds in RMB will encourage its use in international financial centers.
- Boost growth in its lower income western provinces by building overland economic connectivity with Central Asia.

To support the BRI, Beijing has injected massive amounts of capital into Chinese public financial institutions, such as the Chinese Development Bank (CDB) and the Export Import Bank of China (EXIM). These banks enjoy very low borrowing costs allowing them to lend cheaply to Chinese companies working on BRI projects. This easy financing enables SOEs to offer highly competitive bids for projects against foreign countries. For instance, in 2015 Japanese construction companies lost out to their Chinese counterparts in a bid to build a high speed rail project in Indonesia.

Some BRI projects are already under way, such as those associated with the China-Pakistan Economic Corridor (CPEC) – a 3000



kilometer corridor that runs from China's Kashgar to Pakistan's Gwadar. CPEC includes a wide array of infrastructure projects including highways, railways, pipelines and optical cables, but more than half of the total planned investment for CPEC will go to energy projects like power plants. CPEC is intended to connect the land based Silk Road Economic Belt with the Maritime Silk Road. The first steps have already been taken by the state owned Chinese Overseas Ports Holding Company, which has expanded Gwadar Port and leased it from the Pakistani government until 2059. A highway from Kashgar to Gwadar has also been considerably upgraded. Further development projects in CPEC include the Gwadar Special Economic Zone, which is currently under construction next to the port and due for completion by the end of 2020.

The BRI would enable China to gain new overseas markets, influence other countries to adopt China's economic model and expand China's "soft power" in the numerous countries that may participate in the initiative. Since 2013, over 70 countries have signed contracts for projects under the BRI. Between 2013 and 2018 China spent a total of \$614 billion USD on BRI projects. In Africa, the BRI has built airports, railways, manufacturing hubs and infrastructure improvements with significant investments in Nigeria, Ethiopia and Kenya. In Europe, the BRI has made inroads in Central and Eastern Europe and has recently been in dialogue with Portugal and Greece with a specific interest in port access. Italy is the only G7 country to join the BRI. Italy's aim of becoming part of BRI, is to get access for its goods and to also leverage its geo political location within Europe. There is a feeling that by reaching out to Euro skeptics in EU, China is trying to create divisions within the bloc. Countries like Hungary and Greece, which are being increasingly dependent upon

China, have taken a different stance from other EU countries on issues such as The South China Sea and Human Rights violations. In Asia, the BRI has made significant investments in railway and port construction, with proposals in Indonesia, Laos and Malaysia. Many of these countries take Chinese funding because they have few other options. The Trump administration's recent initiative to dedicate \$113 million to new technology, energy and infrastructure initiatives in emerging Asia is far from sufficient to change this calculus.

Digital Silk Road

China stressed the need for Chinese companies to build a 'digital Silk Road' - fiber optic cables, mobile networks, satellite relay stations, data centers and smart cities. Beijing is likely to have its biggest impact on global Internet governance through its trade and investment policies, especially as part of the Belt and Road Initiative. Much of the activity along the nascent digital Silk Road has come from technology companies and industry alliances, not the Chinese government. Alibaba has framed its expansion into Southeast Asia as part of the Belt and Road Initiative. It has acquired the Pakistani e-commerce company Daraz and launched a digital free trade zone with the support of the Malaysian and Thai governments, which will ease customs checks, provide logistical support for companies and promote exports from small and medium sized companies in Malaysia and Thailand to China. ZTE now operates in over 50 of the 64 countries on the route of the Belt and Road Initiative. As well as laying fiber optic cables and setting up mobile networks, the company has been providing surveillance, mapping, cloud storage and data analysis services to cities in Ethiopia, Nigeria, Laos, Sri Lanka, Sudan and Turkey.

There is a strategic dimension to the Digital Silk Road. The lifelines of the modern digital economy are undersea fibre optic cables, which carry more than 98 percent of international internet, data and telephone traffic according to estimates. The bulk of these cables are both geographically concentrated and largely dominated by US power, which has raised concerns in Beijing about data security. China's push to build cross border and undersea cables, such as the Pakistan-China Fibre Optic Project, is motivated by a desire to circumvent heavily trafficked choke points such as the Straits of Malacca and to shield its communications from foreign intelligence agencies.

As part of the Digital Silk Road, China aims to extend coverage of its home grown satellite navigation system to the 60 plus countries along the belt and road. By 2020, China hopes to achieve global coverage with a constellation of 35 satellites, allowing China to end its reliance on US GPS; increase its diplomatic clout in regional and international forums on Position, Navigation and Timing (PNT) related affairs and provide the People's Liberation Army's sensor equipped platforms and missiles with enhanced guidance capabilities. In sum, while the advent of the Digital Silk Road presents opportunities and challenges for China and BRI countries; its ongoing development will raise important questions about the future of the global digital order.²⁴

Chinese Gains from the Belt and Road Initiative

BRI could help re-orient a large part of the world economy toward China. Increasing connectivity between China and countries throughout Eurasia, trade and investment, will render these countries more dependent on the Chinese economy, increasing

China's economic leverage over them. This may empower China to shape the rules and norms that govern the economic affairs of the region. The BRI may win China political gains. Beijing may be able to exploit its financial largesse to influence partner country policies to align with its own interests, particularly in certain countries in Central and South Asia that lack good governance and robust rule of law. Accepting Chinese capital may come with prospect that Chinese companies will manage infrastructure including critical infrastructure. Investment into strategic locations like Gwadar will help diversify China's transport network for critical natural resources like oil and gas, which could reduce dependency on the Strait of Malacca.²⁵ China's BRI initiative is meeting a need and filling a void left by international financial institutions (IFI) as they shifted away from hard infrastructure development. China has been responsive to requests from recipient countries. This adaptability has made BRI resilient and attractive to recipient governments in spite of popular concerns expressed in multiple countries.

The BRI shouldn't be seen as a traditional aid program because the Chinese themselves do not see it that way and it certainly does not operate that way. It is a money making investment and an opportunity for China to increase its connectivity. The initiative has a blend of economic, political and strategic agendas that play out differently in different countries, which is illustrated by China's approach to resolving debt, accepting payment in cash, commodities, or the lease of assets. The strategic objectives are particularly apparent when it comes to countries where the investment aligns with China's strategy of developing its access to ports that abut key waterways. While the initiative began with a predominantly economic focus, it has taken on a greater security profile over time.

Japan has long played a quiet but leading role in providing alternative options for recipient countries in need of capital intensive infrastructure investment. Recently, Tokyo has undertaken significant reforms to elevate its ability to both compete with and complement BRI projects. China's investments in strategically sensitive ports and its development of an overseas military base in Djibouti are of great concern to the United States. BRI projects have caused unease in western world due to their impact on democratic governance, debt sustainability and existing international environmental and labour standards. Internationally, a growing number of developing countries are expressing concern about Chinese intent.²⁶

Many US analysts view the BRI differently than how Chinese leaders describe it. For example, Nadège Rolland, senior fellow with the National Bureau of Asian Research states the following: "The Belt and Road Initiative (BRI) is generally understood as China's plan to finance and build infrastructure projects across Eurasia. Infrastructure development is in fact only one of BRI's five components which include strengthened regional political cooperation, unimpeded trade, financial integration and people to people exchanges. Taken together, BRI's different components serve Beijing's vision for regional integration under its helm. It is a top level design for which the central government has mobilized the country's political, diplomatic, intellectual, economic and financial resources. It is mainly conceived as a response to the most pressing internal and external economic and strategic challenges faced by China and as an instrument at the service of the PRC's vision for itself as the uncontested leading power in the region in the coming decades. As such, it is a grand strategy."

BRI could pose financial risks if borrowers do not repay loans or if recipient countries do not view Belt and Road as benefiting them. In

October 2017 US Secretary of State Rex Tillerson criticized certain aspects of Belt and Road initiative. He said, “We have watched the activities and actions of others in the region, in particular China and the financing mechanisms it brings to many of these countries which result in saddling them with enormous levels of debt. They don’t often create the jobs, which infrastructure projects should be tremendous job creators in these economies, but too often, foreign workers are brought in to execute these infrastructure projects. Financing is structured in a way that makes it very difficult for them to obtain future financing and often times has very subtle triggers in the financing that results in financing default and the conversion of debt to equity.”²⁷

There has been head winds in many BRI projects across the globe due to high interest rates, non-transparency in the deals, use of Chinese material and labour, sovereignty issues etc. Examples of resistance by countries are:-

- Upon taking office in May 2018, Malaysian Prime Minister Mahathir Mohamad suspended a host of Chinese funded infrastructure projects, asserting that his country could not support the unprecedented level of debt and charged China with implementing a new version of colonialism.
- In Indonesia lending from China has become a focus of campaigning for presidential elections. President Joko Widodo courted Chinese investment and aid. His rival Prabowo Subianto announced during the poll campaign that he would review China funded projects country if he won.

- Ethiopia has expressed debt concerns over Chinese built projects. Repayment on its \$4 billion railway linking capital Addis Ababa with neighboring Djibouti has been extended by 20 years over concerns of debt distress. China's state owned insurer admitted that the due diligence on the Africa's first fully electrified cross border railway had been 'downright inadequate'.
- Fears of unsustainable Chinese lending in Zambia led critics to allege that China will take control over key state assets due to the Zambia's indebtedness including Kenneth Kaunda International Airport.
- Sierra Leone cancelled plans for a China funded airport.
- Kenya risks losing the lucrative Mombasa port to China should the country fail to repay huge loan advances by Chinese lenders. Also at stake is Inland Container Depot at Nairobi.
- Pakistan sought a bailout due to its balance of payment crisis, partly stemming from its debts to China for infrastructure projects assumed under the \$62 billion China-Pakistan Economic Corridor. In each of these cases, debt diplomacy has been used to define China's engagement abroad.
- Myanmar has demonstrated some hesitation to accept Chinese investment. In 2011 the government of Myanmar halted construction of the Myitsone Dam due to concerns over growing Chinese influence as well as potential environmental damage. Myanmar sought

to scale back a massive \$7 billion port in its troubled Rakhine state out of fears that it involves too much debt for the country.

- Bangladesh terminated a plan to have a Chinese state run firm construct a 214 kilometer (130 miles) highway from capital Dhaka to its northeast. Bangladesh officials made allegations of corruption against the state backed Chinese Harbor Engineering Company (CHEC) amid unhappiness over the price tag of \$2 billion.
- In December 2017 the Sri Lanka government lost its Hambantota Port to China for a lease period of 99 years after the Sri Lanka government failed to show commitment in payment of billions of dollars in loan.

BRI has encouraged the inception of many economically unsound projects. Kyrgyzstan's Kara Balta oil refinery, funded in 2013 by Chinese partners to the tune of roughly \$350 million, runs at no more than 6 percent of its capacity. The refinery's difficulty stems from insufficient crude oil sourcing, which could have been easily identified during planning and evaluation stage of the project. Chinese investment in more than 30 casinos in Cambodia's Sihanoukville has contributed to a rise in the eviction of families, the shuttering of hundreds of local businesses and a loss of tourists. The casinos have paid handsome returns to the Chinese investors.

BRI infrastructure projects in Central Asia, Pakistan and Myanmar are projected to lose money due to underutilization and could potentially cause more harm than good. Many BRI projects are expected to reap benefits only over the long term, but will tie up

large amounts of capital in the meantime that could otherwise be more productively employed elsewhere. This has proven the case with Qinzhou port in southern China, which was slated to function as a crucial hub for trade with Southeast Asia but is still severely underused even five years after completion. China has pledged to invest \$5 billion in Venezuela, a country now in dire economic crisis, unable to make interest payments on \$50 billion in international bonds. In exchange, Venezuela will increase oil exports to China by a million barrels a day.

China made advances in the US's own backyard. Chile joined the more than half dozen Latin American and Caribbean countries that have agreed to be part of the BRI program. Panama, which signed on to BRI in 2017 after abandoning Taiwan as a diplomatic ally, accepted a Chinese bid to build the next bridge over the Panama Canal.

Despite early signs of trouble China seems to be determined to push ahead with the BRI, which the country's leaders have established as a pillar of their new "grand strategy." China also is reevaluating the complete process. BRI is a long term plan. Many of its projects are still in their planning phases and will not be completed for years to come. While offers of Chinese investment have been met with mixed responses, should China successfully complete a few keystone projects the reception could become much warmer. BRI has the potential to forge stronger economic and political bonds throughout the region.

China's Strategy

The United States' strategy for transforming China through engagement failed because Chinese leaders devised, implemented

and have continued to refine an effective strategy of their own for countering it. Deng Xiaoping and his successors were well aware of what they saw as a trap laid for them by their Western counterparts and they were determined to avoid it.

I – Resources

Over the past quarter century, China's growth has led to exploding demand for resources of all kinds leading to surging imports of energy, minerals, raw materials and food. The vast majority of these imports reach China by sea, a domain dominated by US naval power. China is well aware of its Malacca Dilemma and has gone to considerable, often costly lengths to mitigate them. Some of the measures taken by China are:-

- Sought to ensure control over the physical means of production by purchasing mines, oil fields and farm land in foreign countries.
- Acquired key portions of the maritime transportation system through which resources are carried back to China by greatly enlarging its commercial fleet and buying, building and expanding overseas port facilities.
- Under the “belt” portion of the Belt and Road Initiative, China has begun to invest heavily in overland roads, railways and pipelines that could provide at least a portion of needed supplies in the event of a maritime blockade.

All these investments represent a form of insurance, a hedge against strategic risk.²⁸ Even after China becomes the world's largest economy, its prosperity will remain dependent on the prosperity

of its global rivals and vice versa, including the United States and Japan. The richer China becomes, the greater will be its stake in the security of sea lanes, the stability of the world trade and financial regimes, nonproliferation, the control of global climate change and cooperation on public health. China will not get ahead if its rivals do not also prosper. Chinese strategists have to understand that core US interests — in the rule of law, regional stability and open economic competition — do not threaten China's security.²⁹

II - Technology

China has made some long term strategy in technology sector and has been pursuing them vigorously. 13th Defence Science and Technology and Industry Five-Year Plan (2016–2020) calls for streamlining and targeting investment across core areas, accelerating weapons development, raising arms exports and promoting collaboration between military and civilian organizations. Another key initiative is the 2025 Defence Science and Technology Industry Plan, which calls for the upgrade of China's defence science and technology base. This is in line with the Made in China 2025 strategy — a sweeping initiative to overhaul China's manufacturing industry.

Moreover, China outlined a list of sixteen megaprojects in the Medium and Long-Term Science and Technology Development Plan (2006-2020). These include advanced numeric-controlled machinery, high-end generic chips, integrated circuit manufacturing and techniques, high-definition earth observation systems, advanced nuclear reactors, manned aerospace and moon exploration and large aircraft. These projects involve numerous companies and research institutions from China's sprawling defence industry. Technologies

developed for every one of these megaprojects would have important military applications in addition to civilian uses.

China is the world's top exporting and trading country, having exported \$430.3 billion worth of goods into the US in 2017. The sheer size of China's population combined with a growing middle class, has provided a market of which the West wants to explore. Facebook and Google have repeatedly tried to reenter China, with each company changing policies and creating new products to try to get into the Chinese system. China has shed off its image of copycat nation. It has a strong entrepreneurial spirit. Its digital payments market is 50 times larger than that of the US. Its two largest internet companies – Alibaba Group and Tencent Holdings – are leaders in online gaming, social media and e-commerce. From the lightweight, cutting edge Mavic Pro drone (which controls over 70 percent of the commercial drone market), to the booming bike sharing industry and all inclusive app WeChat, the technological innovation emerging from China is now met with due admiration even by the West.

These and other Chinese tech giants are investing aggressively in new businesses, helping to transform China into a massive market for venture capital investments. Those ventures are nourished by China's huge and growing market and its unique ecosystem of suppliers, logistics specialists and manufacturers. China has produced a new generation of homegrown entrepreneurs who are creating world class products, developing their own technologies and rolling out new business models on a scale and with a speed the global economy has never seen.

China overtook the US as the world's largest market for e-commerce in 2015. This year online sales are expected to top \$1.1 trillion,

according to eMarketer, a data research firm. McKinsey says China alone now accounts for nearly half of worldwide e-commerce—up from less than 1 percent only a decade ago. Goldman Sachs expects online retail sales in China to grow at an annual average of 23 percent over the next four years, topping \$1.7 trillion by 2020.³⁰

III - Surveillance

Modern digital technologies offer a possibility to build an actual surveillance system to notice and assess everyday actions of the citizens. A new Chinese system relying on total surveillance and big data is set to become fully operational in 2020. It is already functioning. In one of its manifestations, twenty three million Chinese citizens have been banned from buying travel tickets for various actions in their lives that the system frowns upon. These digital technologies have helped China to make Xinjiang region into one huge concentration camp in order to “transform” the culture of the local ethnic and religious minorities. The camps are claimed to have “re- education” purpose.

Given the planned expansion of the total surveillance and behavior control system to all of China, the Beijing regime’s actions in Xinjiang might turn out to be a pilot project with potential for some degree of application beyond that unfortunate province. All these techniques of statecraft are really not something one would like to see becoming more widespread in the world. This would probably happen if China were to become the world’s preeminent great power. China’s surveillance practices are spreading beyond its borders. In Cambodia China’s influence empowers suppression of democracy by the local authoritarian regime. Zimbabwe has installed Chinese

provided facial recognition and monitoring system throughout the country. Tanzania and Uganda have adopted cyber security legislation that restricts freedom of internet content, resembling China's model and helped by its technical assistance. In Pakistan, a Chinese run surveillance system has been established along the route of China-Pakistan Economic Corridor.

As stated in the Freedom House's Freedom on the Net 2018 report, Chinese firms "provided high tech tools of surveillance to governments that lack respect for human rights." Freedom House counted eighteen countries where Chinese firms "are combining advances in artificial intelligence and facial recognition to create systems capable of identifying threats to 'public order.'" Representatives from thirty six nations attended seminars where Chinese officials were sharing their information management know how. The notion of the internationally spreading Chinese "techno dystopian" model, mentioned in the report, is now entering the wider public discourse.

If China were to lead the world, then democracy would be hard pressed to remain the mainstream form of political regime it has been for the last century. Modern China's political and legal norms and practices would closely follow the global spread of the Chinese geopolitical and economic dominance. That is why the ongoing competition between America and China will decide much more than just the great power careers of these two nations. This competition is, in effect, a struggle about what kind of world we are all going to live in.³¹

Chapter – 3: China 2025

China's Opportunity

Global industry is at the brink of the next technological revolution. The combination of intelligent machines, modern communication, big data and cloud computing is creating a disruptive change in industrial production. “Smart Manufacturing”, “Industry 4.0” and “Industrial Internet” are different labels for this upcoming transformation. Governments and industries around the world recognize that this new technology paradigm will reshape the dynamics and rules of global competition. The race for advanced industrial production could decide the fate of large corporations and even the overall development of entire economies.

China sees this global race as an excellent opportunity to catch up technologically and economically with industrial countries. The goal is to become a global leader in manufacturing high quality and high tech products by the first half of the 21st century. China is in a poor starting position in the global race for smart manufacturing. The current level of automation and digitization in China's industry is much lower than in industrial countries. China understands well that the country's future economic progress and prosperity cannot be based on old factories and manual labour.

Introduced by China's State Council in May 2015, the Made in China - 2025 (MIC-2025) initiative is the latest in a series of ambitious state led programs introduced by the Chinese government that seek to modernize the Chinese economy by increasing the competitiveness of Chinese industries, fostering Chinese brands, boosting innovation and reducing China's reliance on foreign technology and make China a major or dominant global manufacturer of various technologies.

'Made in China'

Made in China-2025 is a top down strategy. The leadership imposes its policy priorities and strategic vision for industrial upgrading on a manufacturing industry that has been largely hesitant about industrial modernization. This strong role of policy as the driver of smart manufacturing development stands in stark contrast to the pivotal role of enterprise initiative in the bottom up process in Germany, the United States and many other countries. MIC-2025 is part of Chinese President Xi Jinping's ambitious plan to achieve the "great rejuvenation of the Chinese nation" and restore China to what Xi believes is the country's rightful place as a great power by 2049 — the centennial of the PRC's founding. At the 19th Party Congress in October 2017, Xi laid out a multi stage plan with specific goals for 2020, 2035 and 2050. By 2035, he said China would be a top ranked innovative nation and by the middle of the century would be transformed into a leading global power.

MIC-2025 is the first stage of a larger three step strategy to transform China into a leading manufacturing power. The steps are:-

- China is to improve the overall quality of manufacturing, boost innovation and labor productivity, obtain an

advanced level of information technology integration, reduce energy and material consumption and develop multinational enterprises and industrial clusters with strong international competitiveness.

- By 2035, China seeks to reach “an intermediate level” among world “manufacturing powers,” greatly improve innovation capability, make “breakthroughs” in major areas, boost competitiveness and become a global leader in various innovation industries.
- By 2049 and coinciding with the 100th anniversary of the founding of the People’s Republic of China (PRC), China aims to “become the leader among the world’s manufacturing powers,” have the “capability to lead innovation and possess competitive advantages in major manufacturing areas,” and “develop advanced technology and industrial systems.”

Xi Jinping has underscored the urgency to develop strategic emerging industries and make China into a leading high end manufacturing superpower as well as a center for science and innovation. In an address to top Chinese engineers and academics in May 2018, Xi called for the “fundamental transformation of business models of the manufacturing sector and the integration of the internet, big data and artificial intelligence with the real economy so as to move China’s industries up to the middle and high end in the global value chain.”³²

MIC-2025 is inspired by Germany’s Industry 4.0 development plan. The Chinese Academy of Engineering embraced the German concept

when drafting its ‘Manufacturing Superpower’ report in 2013. The report served as a scientific foundation for the formulation of Made in China 2025. Following the Academy’s report, the political leadership kicked off an energetic campaign in 2014. President Xi Jinping, Prime Minister Li Keqiang and Deputy Prime Minister Ma Kai made important comments on Industry 4.0 and paid and received several state visits to and from Germany revolving around cooperation on this topic.³³ Germany’s “Industry 4.0” plan, aims to establish Germany as a lead market and provider of advanced manufacturing solutions.³⁴ However, there are substantial differences between MIC 2025 and Industry 4.0. Some of them are:-

- China’s state subsidies are much larger and are used for many purposes, not just basic research as in Germany’s plan.
- China has specific targets for replacing imports with indigenous production, which is not a feature of Industry 4.0.
- Germany’s economy is far more open to foreign participation and competition than China’s economy.³⁵
- The difference with Germany’s plan is the amount of support that the Chinese state will provide for MIC 2025 industries through state funding, tax breaks, low interest loans and other subsidies is not in public domain.³⁶

Made in China 2025 - The Plan

Creating an internationally competitive manufacturing industry is the only way for China to upgrade its overall national strength,

safeguard national security and build a world power. To build China into a manufacturing power that leads the development of the world's manufacturing industry and lay a solid foundation for realizing the Chinese dream of the great rejuvenation of the Chinese nation "Made in China 2025" is the action plan for China's implementation of the first decade of the strategy of making a strong country. MIC 2025 lists out the following.

Strategic Tasks and Key Points

- To achieve the strategic goal of making a strong country, China must adhere to:-
 - The problem orientation.
 - Make overall plans.
 - Highlight key points.
 - Unite the consensus of the whole society.
 - Accelerate the transformation and upgrading of the manufacturing industry.
 - Comprehensively improve the quality of development and core competitiveness.

To achieve these task China should :-³⁷

- Improve the innovation capability of the national manufacturing industry.
- Promote the deep integration of informationization and industrialization.
- Strengthening industrial infrastructure capabilities.

- Strengthening the construction of quality brands.
- Full implementation of green manufacturing.
- Deepen the adjustment of manufacturing structure.
- Actively develop service oriented manufacturing and production service industries.
- Improve the level of international development of manufacturing industry.
- Vigorously promote breakthrough development in key areas of:
 - A new generation of information technology industry.
 - High end CNC machine tools and robots.
 - Aerospace equipment.
 - Marine engineering equipment and high tech ships.
 - Advanced rail transit equipment.
 - Energy saving and new energy vehicles.
 - Power equipment.
 - Agricultural machinery and equipment.
 - New materials.
 - Biomedical and high performance medical devices.

Concern of US Policymakers and Stakeholders

Western Critics of MIC 2025 contend that:-

- MIC 2025 will advance China's goal of integrating its defense and commercial economies, which is aimed at strengthening the country's innovation capability for dual use technologies in key strategic industries, including aviation, robotics and information technology.³⁸ The Pentagon warned in 2017 that state-led Chinese investment in US firms working on facial recognition software, 3D printing, virtual reality systems and autonomous vehicles is a threat because such products have "blurred the lines" between civilian and military technologies.³⁹
- China's ambition to control entire supply chains, some of which have potential application to military manufacturing, poses a risk that entire industries could come under Chinese control. Today only four companies are comprehensive providers of Telecommunications equipment infrastructure: Huawei, ZTE, Ericsson and Nokia. Two of those four are Chinese companies. Many other US and European companies that were producing telecom equipment folded in the last few decades.⁴⁰
- Chinese government subsidies distort markets, undercut western manufacturers and result in overcapacity and the dumping of cheap products in the global market. In the case of solar panels, where government support in the form of fiscal subsidies and tax incentives to the production of Chinese solar cells and panels combined with government backed theft of intellectual property drove nearly 30 US manufacturing firms out of the business.

- The plan suggests that China's intention is not just limited to joining the ranks of high tech economies, but rather envisages displacing them. The plan foresees the targeted industries developing in three phases to capture both domestic and international market share in many industries and technologies. They are:-
 - Localize and indigenize R&D and control segments of global supply chains.
 - After dependence on foreign technology has been reduced, proceed with substitution.
 - After Chinese technology and brands are developed, capture global market share.
- Establishing quotas violates WTO rules against technology substitution.
- MIC-2025 emphasises on the acquisition of advanced technology. China will buy out foreign companies as well as forced technology transfer agreements and use cyber espionage to procure cutting edge technologies.
- Together with the Plan to Enhance Standardization and Quality of Equipment Manufacturing, MIC 2025 will help China to spread Chinese standards abroad and undermine Western standards.

Chinese firms such as Huawei and ZTE are building upon their success as global leaders in key telecommunications technologies and racing to become leaders in 5G patents and network deployment.

Huawei is the world’s second-largest firm in Ethernet switches and routers based on 2017 revenue, after US telecommunications firm Cisco.⁴¹

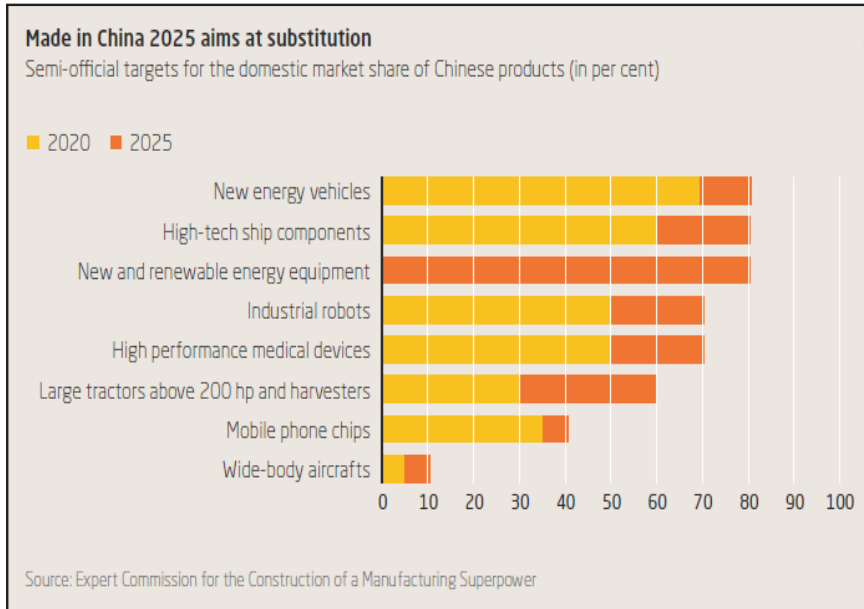
World’s Largest Firms in Select Telecommunications Technologies, 2017

Key Technologies	Leading Firms (global market share based on revenue)
Mobile infrastructure hardware	Huawei (28 percent), Ericsson (27 percent), Nokia (23 percent), and ZTE (13 percent)
Enterprise wireless local area network (WLAN)	Cisco (43.6 percent), Aruba Networks * (14.9 percent), ARRIS/Ruckus † (5.9 percent), Ubiquiti ‡ (5.6 percent), and Huawei (5 percent)
Ethernet switches	Cisco (54.9 percent), Huawei (8.3 percent)
Routers	Cisco (36.7 percent), Huawei (23.8 percent), Juniper (18 percent)
Smartphone semiconductors	Qualcomm (42 percent); Apple (22 percent); MediaTek § (15 percent)

Note: Mobile infrastructure hardware comprises radio access network, switching and core equipment.

Some critics contend that such targets constitute an import substitution plan that will likely hurt foreign high technology suppliers and appears to violate World Trade Organization rules. Government support through MIC-2025 has delivered visible results. Patenting shows that China will contribute important innovations in the most advanced technologies for smart manufacturing in the coming years. The number of Chinese patents for Industry 4.0 related technologies has grown very rapidly since 2006. Industry 4.0 is characterized by the combination of advanced internet and communication

Mercator Institute for China Studies has done a remarkable analysis of MIC-2025:-⁴²



technologies, embedded systems and intelligent machines. In Cyber Physical Systems (CPS), connected machines collect massive amounts of data through smart sensors, communicate with each other and independently make decisions. These systems create and analyse big data to optimise production processes and logistics. Whereas the German term Industry 4.0 emphasises engineering, the American Industrial Internet focuses more on the software related elements of smart manufacturing.

Chinese innovation activities are particularly strong in technology fields with high political support: traditional industrial robots, wireless sensor networks and smart sensors. In contrast, Chinese innovation activities are weaker in cloud computing and big data, advanced robots and information security. China's industrial

planning is in the same line with the development strategy of other great manufacturing countries. Japan's rise to dominance in industries from automobiles to home electronics had the backing of the Ministry of International Trade and Industry. Governments in the US and Europe funded immensely for science and technology for advancing competitiveness. Chinese officials contend that the MIC-2025 plan is transparent, open and nondiscriminatory. The domestic content numbers are goals, not mandates. A 2017 study by the US Chamber of Commerce concluded that "MIC 2025 aims to leverage the power of the state to alter competitive dynamics in global markets in industries core to economic competitiveness. By targeting and channeling capital to specific technologies and industries, MIC 2025 risks precipitating market inefficiencies and overcapacity, globally."⁴³

What stands out in the case of China's 2025 plan are three factors:-

- Scale of government support. With investments from central and local government, state banks and state enterprises, funding for China 2025 is considerable.
- Testing the limits of fair competition. A report released in March 2018, by the US Trade Representative accused that China isn't playing fair. The 215 page document concludes that China is deploying a well financed strategy to "displace" foreign companies and "undermine the global trading system."
- China's size and politics. Taiwan, South Korea and even Japan could transform themselves into industrial powerhouses without testing the global balance of power. China, with its population of 1.4 billion, has the

ability to overtake the US as the world's biggest economy. China will challenge the global order as it becomes the economic leader.⁴⁴

Strengths and limitations of Made in China - 2025

Key Findings:

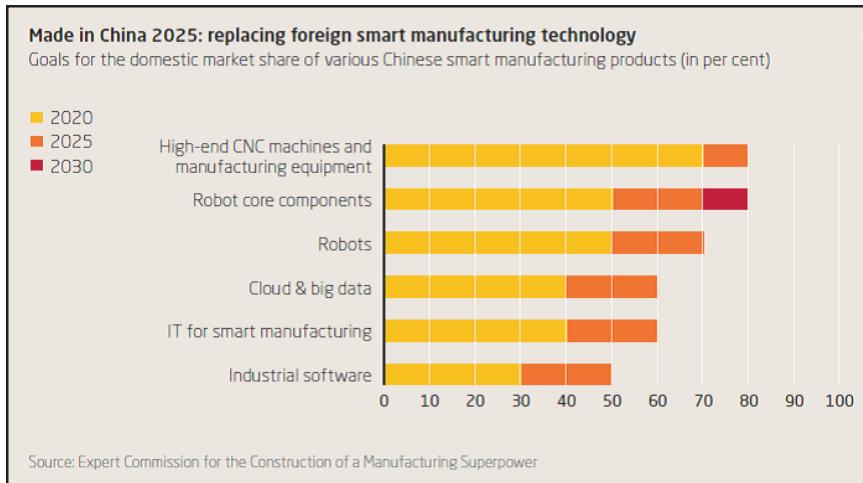
- Major strengths of MIC 2025 are its mobilization capacity, long term planning, generous funding, local experimentation and strong local initiatives.
- Mismatch between political priorities and industry needs, the fixation on quantitative targets, inefficient allocation of funding and overspending by local governments are some of the major weaknesses.
- The overall downward pressure on China's economy, the possible effects of upgrading on the labour market and the shortage of skilled labour, is likely to diminish the effectiveness of the policy.
- MIC-2025 will not lead to wide ranging industrial upgrading nor will it create a broad based industry of tech suppliers within the next decade.
- However, the initiative will succeed in building a small, highly competitive group of manufacturers and tech suppliers of smart manufacturing, significantly enhancing China's economic competitiveness in domestic and global high technology markets.

Manufacturers - A small but growing group of front runners will challenge the industrial countries:

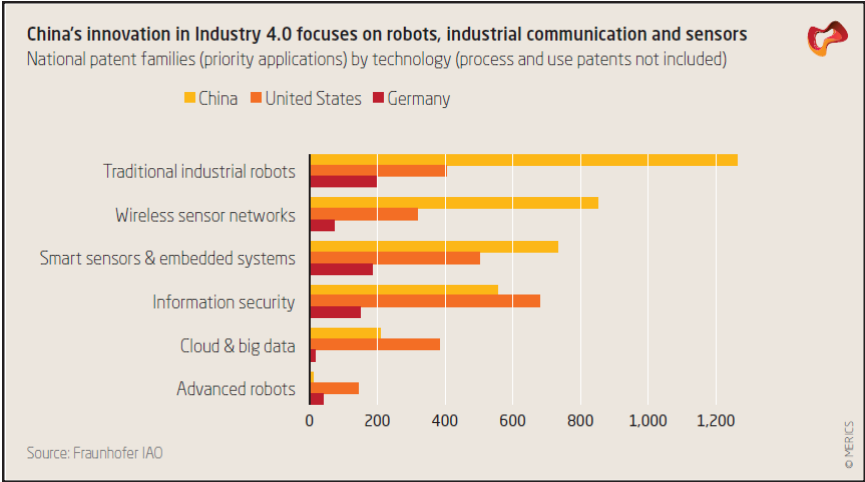
- Made in China 2025 will have different effects on different enterprises: China will have frontrunners, hopefuls and latecomers in the use of smart manufacturing.
- A small number of frontrunners will become highly competitive on the world market. The frontrunners upgrade their processes out of their interest, but policy is important in accelerating their efforts.
- The policy will have the biggest impact on the hopefuls. This group of enterprises operates at a less advanced level but will move to upgrade production to the next level if provided with the right incentives.
- The hopefuls' success or failure will depend on effective policy implementation.
- The development of the group of hopefuls will determine China's competitiveness in smart manufacturing in the medium term.

Chinese tech suppliers: lagging behind but rising:

- Several Chinese tech suppliers will be propelled forward by China's smart manufacturing initiative. They will bridge the technology gap and become serious domestic and international competitors in fields such as robotics, industrial software and 3D printing.
- The pace and degree to which Chinese tech suppliers will become competitive depends largely on the effectiveness of the initiated policy activities.



- A significant technology gap still exists. Foreign suppliers currently benefit from China's smart manufacturing boom. However, they need to be prepared to see their market opportunities and shares dwindle swiftly within the next ten years.
- The pace of technological catch up and intensifying competition varies markedly by technology. The competitiveness of Chinese companies will develop more rapidly in some areas than in others.
- The Chinese ambitions will lead to an increase of technology seeking FDI and knowledge acquisitions. Chinese enterprises, spurred by political targets, support and incentives, will seek to accelerate their technological catch up through strategic technology investments abroad.
- The Chinese government aims to close the technology gap between Chinese and foreign suppliers and to substitute



foreign with Chinese technology by 2025. The envisioned market shares for Chinese products and brands in the MIC-2025 ‘Key Area Technology Roadmap’ demonstrate the ambitious political goal of reducing the market share of international technology suppliers.

An updated version of the plan released in January 2018 said China aimed to become the world’s leading manufacturer of telecommunication, railway and electrical power equipment by 2025 and that China’s robotics, high end automation and new energy vehicles industries would globally rank second or third by 2025. In an interview on November 3, 2017, US Trade Representative Robert Lighthizer stated that China’s MIC-2025 initiative was “a very, very serious challenge, not just to us, but to Europe, Japan and the global trading system.” The United States Trade Representative’s (USTR) 2017 annual report on China’s WTO compliance stated that MIC-2025 differed from industry support by other WTO members in the level of ambition and scale of resources dedicated to obtaining its

goals. The USTR report warned that “even if the Chinese government fails to achieve the industrial policy goals set forth in Made in China 2025, it is still likely to create or exacerbate market distortions and create severe excess capacity in many of the targeted industries.”

Is MIC-2025 Under Review?

After the United States imposed tariffs on China, Beijing dropped references to MIC-2025 in official documents and media. Chinese officials are saying that they are drafting a replacement for MIC-2025 that would play down the goal of making China the dominant global manufacturer and attempt to assuage US concerns by opening up the Chinese plan to participation by foreign companies. Though no new policy has been announced media reports suggested that the new policy would be rolled out in 2019.⁴⁵

Given the close linkages between MIC-2025 and Xi Jinping’s staged plan for national rejuvenation, it is unlikely that substantial changes will be made. Explicit parts of MIC 2025, such as the numerical targets for market share by Chinese companies, are likely to be removed from the public version of the program.

Chapter – 4: Present Status in China

China's Technology Focus

USA in its last National Security Strategy publication underlined China's growing technological prowess as a threat to US economic and military might. China has taken a leading role in several critical emerging technologies. Chinese industries are not only getting closer to the technological frontier in conventional areas such as electronics, machinery, automobiles, high speed railways and aviation, but also driving technological innovations in emerging areas such as new and renewable energy, advanced nuclear energy, next generation telecommunication technologies, big data and supercomputers, A.I., robotics, space technology and e-commerce.

Chinese President Xi Jinping has made developing his country's technological capabilities a key priority, not only to wean China from its dependence on foreign technology but also to turn it into a leader in innovation. China is gaining ground on its rivals in the tech realm. The country has chalked up an array of impressive achievements over the past few years, including its developments in hypersonic missiles, human gene editing trials and quantum satellites. Xi has spelt out his mission clearly. His immediate target is leading the country to celebrate the Party's 100 year anniversary in 2021, by when China would have eliminated absolute poverty and established a "moderately prosperous society". The second big

target is to establish China as “a top innovation nation” by 2035 and a nation with “global influence” and a “world class military”, on a par with the U.S, by 2050.

Today, China has the largest number of unicorns outside the US. According to Price Waterhouse Coopers, in 2014, China overtook Europe as a destination for venture capital. Currently three of the world’s top five most highly valued private companies like ride hailing giant Didi Chuxing, phone maker Xiaomi and e-commerce firm Meituan Dianping are Chinese. China represents approximately 15 percent of the upper net worth and ultra-high net worth individuals (HNWIs) in the world. Those groups are growing at a 22 percent CAGR. Personal wealth for upper HNWI is being greater than \$20 million but less than \$100 million and ultra HNWI as having wealth than \$100 million. The US Holds More Than 30 percent of the World’s Upper High Net Worth and Ultra High Net Worth Wealth.

It was believed that China’s established internet giants – Baidu, Alibaba and Tencent, sometimes called “BAT” – began as clones of US companies like Google and e-Bay. But these giants have since evolved in distinct new directions. Today, Tencent’s messaging app WeChat (Weixin) “is like Facebook, WhatsApp, Tinder, PayPal and Slack combined,” Approximately 80 per cent of China’s 731 million internet users are active on WeChat, spending on average 66 minutes a day on the platform, doing everything from hailing taxis to paying their phone bill to leaving voice messages.⁴⁶

There is a school of thought that the Soviet Union excelled in science and technology in the 1970s and 80s, but mostly focused on military and space technologies, which translated very minimally into gains in

productivity and economic performance. That mismatch eventually led to the collapse of the regime as such a model is not sustainable. China may be following the same path. However, China has analysed the fall of Soviet Union very minutely. The Chinese economy is far more efficient than the Soviet economy was. China's hybrid economy offers individuals and companies incentive to push the boundaries in tech development unlike the tightly controlled Soviet economy that hindered innovation. The central government outlines areas in which it would like companies to operate and provides incentives to encourage competition. China's tech giants are eager to outpace one another in the field of, say AI. Baidu, for example, has set its sights on AI as its opportunity to get an advantage over Tencent, Alibaba and Huawei.

Defence Sector

China now has the ability to develop advanced fighters, aircraft carriers, new-generation intercontinental ballistic missiles, drones and other advanced platforms. Another indicator of this progress is China's booming arms exports, which rose 74 per cent from a global share of 3.8 per cent in 2007–11 to 6.2 per cent in 2012–16. While China is still far behind the world's leading arms exporters (the United States and Russia), it is catching up fast. But despite maturing rapidly over the last two decades, China's defence industry continues to be plagued by notable shortcomings such as outdated management models, weak governance, corruption, inflexibility and monopoly power. These weaknesses will need to be addressed if the industry is to better support PLA modernization in the years ahead.⁴⁷

Advantage China

The following facts give a fair indication of progress of China:-

- With a population of 1.4 billion people; China has 620 million mobile internet users as of 2015. 400 millions are in the middle class.
- Exports have grown for the last 30 years at a 17 percent compound annual growth rate (CAGR), making China the world's largest exporter at \$2.3 trillion in 2015.
- In 1980 about 70 percent of Chinese labour force was in agriculture; by 2016 only 30 percent was in agriculture.
- In 1980 only 2 percent were university educated; by 2016 figure was approximately 30 percent.
- In 1980 Shenzhen had a population of 30,000; by 2016, Shenzhen had a population of some 12 million.
- China is the 2nd largest spender in R&D after the US, accounting for 21 percent of the world total which is \$2 trillion. An OECD report says that China could overtake the US in R&D spending by 2020.
- China has overtaken the US in terms of total number of science publications. Technical papers have increased dramatically though their impact may not be that high.
- China has increased its technical workforce five times since 2000 to 1.65 million. It also has more B.Sc. degrees

in science than any other country and the numbers are growing. China in particular has emerged as a new science and technology (S&T) powerhouse.

- China has begun shifting from being an assembler of high tech components, to a maker of super computers and aircraft. It is focusing on becoming the world leader in artificial intelligence (AI), quantum communications, quantum computing, biotechnology and electrical vehicles.
- In 2018, the World Bank reported that the average time to start a business in China was 8.6 days. This represents a significant improvement from 22.9 days in 2017 and is much shorter than the global average of 21 days. This level of efficiency is similar to that of Germany, which requires 8 days, but is still longer than the 4.5 days needed to start a business in the UK and 5.6 days in the US.
- China has worked to cut bureaucratic red tape, as witnessed by the drop in the number of start-up procedures needed to start a business from 11 in 2013 to 4 in 2018, but obstacles persists.
- Between 2014 and 2016, China attracted \$77 billion in venture capital investment, compared with just \$12 billion in the preceding two years.
- China alone now accounts for nearly half of worldwide e-commerce—up from less than 1 percent only a decade ago. Goldman Sachs expects online retail sales in China

to grow at an annual average of 23 percent over the next four years, topping \$1.7 trillion by 2020.⁴⁸

Three data driven approaches provide a guide to where Chinese companies are catching up with global leaders and where they're not:-

- **Patent applications.** In most of the sectors targeted in China 2025, the country has increased its share of patent applications over the past decade, with progress in next generation information technology especially rapid.
- **Trade.** In shipping, power equipment and rail equipment, China has picked up significant global market share. In engines, medical equipment and nuclear reactors, it's gained a little. Elsewhere, progress is more limited.
- **Revenue.** In sales of rail equipment and new energy vehicles, Chinese manufacturers have already overtaken global leaders; they're catching up in maritime equipment, power generation, information technology and biopharma and medical products; for the remaining sectors, the gap is wide and not being closed.

German autos, South Korean electronics, autos and shipping and Taiwanese electronics all face a competitive threat from China's push.

China is a Net Tech Importer

In spite of all the developments that have taken place in China it remains a net importer of technology. China, the world's most

voracious consumer of semi-conductors, has been trying to build a domestic chip industry since the 1970s and yet the country still imports 10 times more microchips than it can produce. The nation's drug makers lag far behind Western counterparts. Boeing and Airbus executives are not losing sleep over the prospect of competition from China's state owned Commercial Aircraft Corporation of China (COMAC), which unveiled in May, 2017 the C919, the nation's third attempt to build a commercial passenger jet. China wants to move up the value chain from assembling final products from imported components to creating advanced technology in China itself. But imports of chips and technology will be the norm for many years to come.

China is acutely aware of this critical issue and has initiated number of measures to overcome this problem. A few years ago, China's leaders decided they wanted the country to be known for a new kind of electronics – not only 'Made in China', but 'Designed in China'. China has been putting serious money into key areas which they aim to become world leaders in the next decade or so.

Semi-conductor

Today, only 16 percent of the semiconductors used in China are produced in country and only half of these are made by Chinese firms. It is dependent on foreign suppliers for advanced chips. China's dependence on foreign semiconductors has worried Beijing for decades. China suspects that Western semiconductors contain "backdoors," intentional vulnerabilities that can be exploited for intelligence and military purposes. In 2016, President Xi Jinping said, "the fact that core technology is controlled by others is our greatest hidden danger."

China spent billions of dollars in earlier decades to develop indigenous chip industry, which is vital to national security and the success of China's technology industry with little success. Chinese firms had access to equipment but did not have experience and "know how." China's share of worldwide wafer fabrication capacity rose to 14 percent last year, up from virtually nothing in 2000. China's chip making capabilities remain concentrated in the low and mid-range of the industry. Last year China spent about \$200 billion to import chips, which remains China's second largest import category after crude oil.

In 2014, the government set a goal of raising the share of domestic production of China's chip consumption to 50 percent by 2020 and vowed Chinese firms would compete successfully with global industry leaders by 2030. To that end, Beijing is channeling \$150 billion in public and private funds to domestic chipmakers through 2025.

Though there are Western restrictions on technology transfer, China can take following measures for semiconductor independence:-

- Through drawing technology from Taiwan.
- Can take advantage of "fabless" semiconductor production, where Chinese firms design chips but the manufacturing processes are handled by specialist companies like the Taiwanese Semiconductor Manufacturing Company (TSMC).
- Can try again to build a state funded indigenous industry.

Chinese companies prefer fabless chip production, while the government preferred solution of building domestic semi-conductor fabrication facilities (fabs) which is expensive and risky.

Private Sector

The scale and influence of China's private economy can be summarised by the figure 56789 – the private sector contributes 50 per cent of tax revenue, 60 per cent of gross domestic product, 70 per cent of industrial upgrades and innovation, 80 per cent of total employment and 90 per cent of the total number of enterprises. China's digital giants have led job creation over the past few years and will continue to do so. E-commerce giant Alibaba alone has created some 31 million job opportunities, while DiDi — China's Uber — has employed more than 13 million drivers.

According to a Boston Consulting Group (BCG) report, "If Alibaba generated employment has the same share of China's digital economy in 2035 as in 2015, the platform will create 112 million jobs. If Alibaba's emerging businesses, such as cloud computing and digital entertainment, play a strong future role as well, we can expect another ten million jobs by 2035 – for a total of 122 million jobs." By 2035, the report said, the digital economy will account for more than 400 million jobs.

Business in China today is being led by innovation obsessed executives like:-

- Ren Zhengfei, founder of Huawei Technologies, which last year filed more patent applications than any other company in the world.
- Allen Zhang, who led the team that developed Tencent's WeChat, the smartphone app that allows its 900 million users to chat, shop, pay, play and do just about anything else.

- Robin Li, CEO of Baidu, the Beijing based search company, who has vowed to have autonomous vehicles ready for sale in China by next year.

Chinese tech giants are able to collect and analyze data not only from a huge number of consumers, but also in a way that allows the companies to know the minute details of their customers' lives: where they live, where they travel, where they shop, what they buy, what music they like, who they socialize with, what kind of health care they're receiving. This is due to China's indifferent attitude toward privacy and antitrust rules. China's technology behemoths have global ambitions. They are taking their battles with each other overseas—in the form of VC investments outside China. Alibaba spent \$1 billion last year to secure a major stake in Singapore based Lazada, the largest e-commerce company in Southeast Asia. Meanwhile, Ant Financial holds shares in PayTM, in India and has snapped up stakes in fintech companies in Korea, Thailand, the Philippines and Indonesia.

In the first decade of the 21st century, the party further embraced the private sector and elevated its political status by opening up membership and promoting a select group of businessmen to party and government positions. However, there are major contradictions in China. The Communist Party appears to be increasingly putting the squeeze on it, according to widespread perceptions among private companies. Despite its rising economic and political influence the private sector, much like overseas investors, is still largely treated as a second class player next to the state sector. Like foreign investors who have long cried out for an even playing field, Chinese private firms have also largely been shut out of strategic and potentially

lucrative sectors such as banking, health care, energy, television and broadcasting.⁴⁹

According to US economist Nicholas Lardy in his recent book *The State Strikes Back*, subsidies appear to be much smaller for the private sector. Of direct subsidies of RMB 157 billion for 2015 two thirds or RMB 111 billion went to 966 listed state owned companies, leaving RMB 46 billion for 2000 or so listed privately owned businesses. At an average of US \$3.45 million per listed company that is quite substantial help, but not the kind of money that makes a difference to the global export performance of a large business. Lardy's analysis also suggests that most of the subsidies to private businesses in China are of a kind frequently provided in Europe, the United States and other advanced economies such as Australia. They are not provided to support loss making businesses. Instead they support research and development spending, encourage the use of energy efficient technology and in other ways support government policy objectives, just as they do in Australia and the United States.⁵⁰

Cyber

Chinese President Xi Jinping has outlined his plans to turn China into a “cyber-superpower.” More people in China have access to the Internet than in any other country. China aims to build an “impregnable” cyber-defense system, through domestic regulations, technological innovation and foreign policy. It wants a greater voice in Internet governance, foster more world class companies and lead the globe in advanced technologies. Cyber power sits at the intersection of the following Chinese national priorities. The priorities are:-

- Ensure a harmonious Internet.

- Reduce its dependence on foreign suppliers of digital and communications equipment. China is wary of the risk of cyberattacks on governmental and private networks that could disrupt critical services, hurt economic growth and cause physical destruction.
- “Cyber sovereignty” as an organizing principle of Internet governance, in direct opposition to US support for a global, open Internet.

In 2015, China issued guidelines that aim to get Chinese firms to produce 70 percent of the microchips used by Chinese industry by 2025. The government has committed \$150 billion over the next decade to improve China’s ability to design and manufacture advanced microprocessors.

Quantum Computing

Quantum computing uses the laws of quantum mechanics—essentially the ability of quantum bits, or “qubits,” to perform several calculations at the same time—to solve certain problems that ordinary computers cannot. Advances in this area could allow Chinese intelligence services to create highly secure encrypted communications channels and break most conventional encryption. High speed quantum computers could also have major economic benefits, remaking manufacturing, data analytics and the process of developing drugs. In 2016, China launched the world’s first satellite that can communicate using channels secured by quantum cryptography and constructed the world’s longest quantum communications cable, connecting Beijing and Shanghai.

Artificial Intelligence

In November 2017 China's Ministry of Science and Technology announced that it had formed a sort of dream team made up of the biggest Chinese tech firms -- Baidu, Alibaba and Tencent - to lead the country's AI development alongside voice recognition software developer iFlytek. This is the first group to develop systems that can drive autonomous cars, diagnose diseases, act as intelligent voice assistants and manage smart cities, in urban spaces that use a wide variety of sensors to collect data on how people live. It would then analyze that data to reduce cities' environmental impact, spur economic development and improve people's quality of life. China offers its AI companies a big advantage over their US competitors by giving them access to a huge pool of data as country's population exceeds 1.3 billion people and data privacy is a low priority for Beijing.

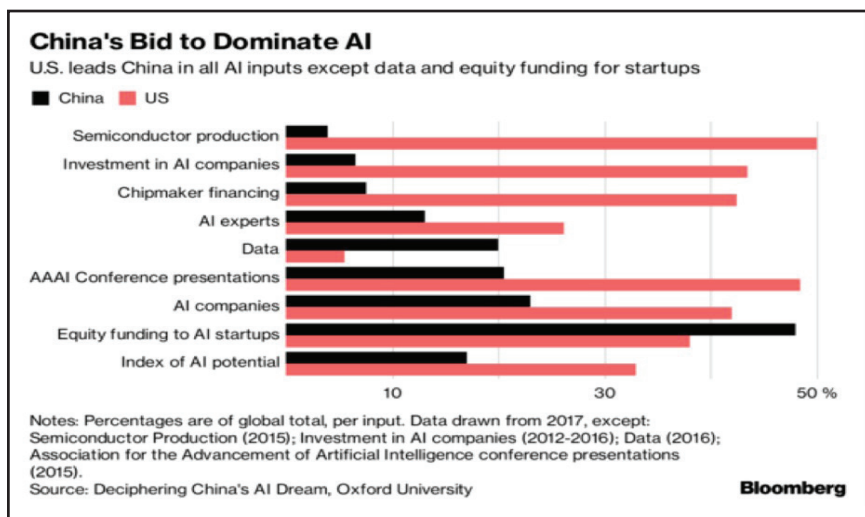
The Chinese government laid out a plan to be the global leader in artificial intelligence by 2030 and to develop an industry worth some \$150 billion. Billions in VC funding are already flowing into Chinese A.I. startups. Chinese tech major Baidu announced its decision of setting up two more AI labs in the US, one focusing on business intelligence and the other on robotics and autonomous driving. At an artificial intelligence summit, Eric Schmidt, the former chair of Google, said, "By 2020, they will have caught up. By 2025, they will be better than us. And by 2030, they will dominate the industries of AI." China is racing to harness artificial intelligence for military uses, including autonomous drone swarms, software that can defend itself against cyberattacks and programs that mine social media to predict political movements.

Can China dominate the technologies of the future? As of now China remains far behind in ‘robot densit’. According to the International Federation of Robotics, in 2016, it had only 68 robots per 10,000 manufacturing workers, compared with 631 in South Korea, 309 in Germany, 303 in Japan and 189 in the US. China has been the world’s largest buyer of robots since 2013. In 2017 it bought about 87,000 robots—or about one in three of 294,000 robots sold in the entire global economy. Xi Jinping, has called for a “robot revolution” in China. China’s planners have set a goal of raising the ratio of industrial robots to 100 per 10,000 workers by 2020.⁵¹

5G

The fifth generation mobile network technology, or 5G, will offer much faster Internet speeds to mobile users and enable new uses for Internet connected devices. China is also determined to define international standards for the next wave of innovation, especially

China’s Challenge US Dominance in AI



in 5G. If China can control technology standards, it will ensure that its firms receive royalties and licensing profits as others develop products that plug into Chinese owned platforms.

China has increased the skill, sophistication and size of the delegations it sends to global standards organizations. China was absent for the discussions about third and fourth generation mobile network technologies. Things are different now. Huawei, China's largest telecommunications company, sent twice as many representatives as any other company to the meeting in Vienna that defined the specifications for the coming fifth generation of mobile networks. International 5G standards will be set by 2019, facilitating large scale commercial deployment expected by 2020. Chinese technology companies have become the targets of political pressure in the United States, Europe and Australia. The governments of European countries and US allies like Australia is being pressurized by USA to ban Huawei from supplying equipment for fifth generation mobile networks. Washington is working to limit Chinese investment in US technology companies and has made it more difficult for Chinese telecommunications firms to do business in the United States by:-

- Blocking China Mobile's application to provide telecommunications services in the United States,
- Banning the sale of Huawei and ZTE smartphones on US military bases,
- Prohibit US telecommunications companies from spending critical infrastructure funds on equipment and services from China.

Next Generation Connectivity

5G networks are expected to quicken data speeds by 100 times, support up to 100 times more Internet of Things (IoT) devices and provide near instant universal coverage and availability. US and Chinese companies are engaged in a fierce competition to secure first mover advantage and benefit from the trillions in economic benefits 5G and subsequent technologies are expected to create. The Internet of Things (IoT) and fifth generation wireless technology (5G) will transform how countries conduct business, fight wars and interact as a society. The Chinese government seeks to overtake the United States in these industries to gain a higher share of the economic benefits and technological innovation. The scale of Chinese state support for the IoT and 5G, the close supply chain integration between the United States and China and China's role as an economic and military competitor to the United States create enormous economic, security, supply chain and data privacy risks for the United States.

IoT devices collect enormous amounts of user information; when aggregated and combined with greater computing power and massive amounts of publicly available information, these data can reveal information the user did not intend to share. US data could be exposed through unsecure IoT devices, or when Chinese IoT products and services transfer US customer data back to China, where the government retains expansive powers to access personal and corporate data. Rapid advances in the number and capabilities of IoT devices and 5G networks are strengthening China's strategic deterrent, warfare and intelligence capabilities and eroding the ability of the United States to operate freely in the region. The rapid proliferation of unsecure IoT devices is increasing the avenues

Chinese actors could exploit to deny service, collect intelligence or launch a cyber attack.

China's central role in manufacturing global information technology, IoT devices and network equipment may allow the Chinese government opportunities to force Chinese suppliers or manufacturers to modify products to perform below expectations or fail, facilitate state or corporate espionage, or otherwise compromise the confidentiality, integrity, or availability of IoT devices or 5G network equipment. The lax security protections and universal connectivity of IoT devices create numerous points of vulnerability that hackers or malicious state actors can exploit to hold US critical infrastructure, businesses and individuals at risk. These types of risks will grow as IoT devices become more complex, more numerous and embedded within existing physical structures. The size, speed and impact of malicious cyber attacks against and using IoT devices will intensify with the deployment of 5G.

Chinese firms and China based manufacturing have the dominance in global network equipment, information technology and IoT devices. US telecommunications providers' reliance on imports from China raises serious supply chain concerns about the secure deployment of US critical next generation telecommunications infrastructure. USA is understandably wary of this development. The above issues are applicable to every other country in the world.⁵²

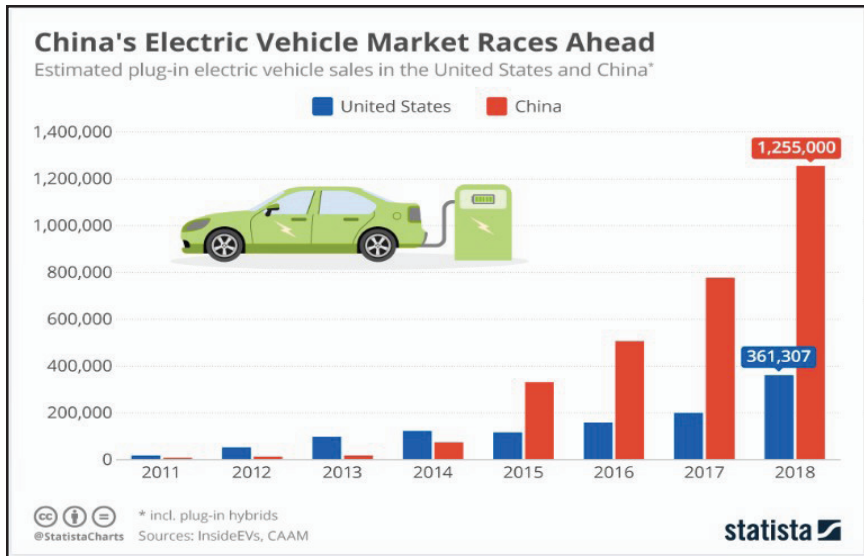
Internet Plus for Smart Manufacturing

China sees this global race as an excellent opportunity to catch up technologically and economically with industrial countries.

Achieving this goal depends on three factors: the ability to develop innovative products, to create internationally well known brands and to build modern industrial production facilities. The Chinese government is seeking to integrate Made in China - 2025 with the Internet Plus plan. Internet Plus is a full blown plan to digitise the economy and society beyond the traditional internet. It seeks to create new information technology solutions in areas such as health, finance, education and transport and smart manufacturing. Despite this overlap with Internet Plus, Made in China 2025 is the main strategy for developing smart manufacturing in China. In contrast to the top down approach of Made in China 2025, Internet Plus is based on bottom up initiatives by internet enterprises. Ma Huateng, CEO of the internet giant Tencent, formulated the “Internet Plus” concept in 2014.

Electric Vehicle

The world has around 3 million buses. Most run on diesel and compressed natural gas. The global fleet of electric buses now totals around 385,000 vehicles. 99 percent of those are in China. Every five weeks, 9,500 brand new electric buses take to the roads in China. A new report by Bloomberg New Energy Finance says: That’s the equivalent of the entire London bus fleet.⁵³ China is winning the electric vehicle race. Demand for electric vehicles in China is soaring. Nearly 1.3 million new energy vehicles (plug in electric vehicles and plug in hybrids) were sold there– a 62 percent rise on 2017. To put that number into context, it’s estimated that as of September 2018, there were only around 4 million electric vehicles in use across the whole world.



The global market is growing exponentially, increasing six fold since 2013 and doubling since 2015. Much of that growth is being driven by China. As this chart shows, it's been just four years since Chinese sales of electric vehicles overtook those in the US. Last year, they were more than three times higher and the gap is predicted to get wider. Although those targets wouldn't quite make China the world's most enthusiastic consumers of electric cars per head of population – that title goes to Norway – the sheer scale of the Chinese market makes it far and away the most important in the world. Tesla has decided to open a huge new manufacturing plant in Shanghai with the stated aim of producing half a million vehicles a year. Production will focus on the Tesla Model 3 solely for the domestic Chinese market.⁵⁴

China's electrification of the transport sector could also shape global energy markets and may shape its geopolitical priorities. By 2021, China will be expected to produce 70 percent of the world's electric vehicle batteries. As well as helping cut pollution, the investment in

electric vehicles comes as China currently consumes 11.5 million barrels a day (mbd) of oil, only 4 mbd of which are produced domestically.

Aviation

According to the International Air Transport Association, China will become the world's largest aviation market by 2022, as an expanding middle class and government support for the sector fuel demand for flights and airport construction. China will add 921 million new passengers by 2036, taking total passengers to 1.5 billion. That compares with 1.1 billion in the US. China plans to build 74 new civil airports by 2020, taking the total to 260 to cope with the surge in passengers,. This amounts to more than eight new airports per year. Some of the more remote regions, including Inner Mongolia, Guizhou, Xinjiang, Sichuan and Heilongjiang, have seen five or more airports built in the last decade.

China's three largest airlines: Air China, China Southern Airlines and China Eastern Airlines are going to become even bigger international players, challenging the dominant US airlines: American, Delta and United and competing for passenger numbers.

Energy

At the start of 2017, China announced that it would invest \$360 billion in renewable energy by 2020 and scrap plans to build 85 coal fired power plants. Chinese authorities reported that the country was already exceeding official targets for energy efficiency, carbon intensity and the share of clean energy sources., China's energy regulator, the National Energy Administration, has rolled out new

measures to reduce the country's dependence on coal. These are the latest indicators that China is at the center of a global energy transformation, which is being driven by technological change and the falling cost of renewables. But China is not just investing in renewables and phasing out coal. It also accounts for a growing share of global energy demand, meaning that its economy's continuing shift toward service and consumption led growth will reshape the resource sector worldwide.

Because 80 percent of its imports pass through the narrow Malacca Strait, China has historically seen this as a strategic weakness, sometimes known as the "Malacca Dilemma". While China's drive for electric vehicles could help minimize this strategic vulnerability, it could open new challenges. For example, the Democratic Republic of the Congo produces 58 percent of the world's cobalt, a vital component of vehicle batteries. The transformations taking place could give way to a new geopolitical map for energy. Various other factors are reducing global resource consumption, including increased energy efficiency in residential, industrial and commercial buildings and lower demand for energy in transportation, owing to the proliferation of autonomous vehicles and ride sharing.

Climate Change and Ecological Civilization

Ecological civilization refers to the aim of achieving harmony between people and nature. The move to make environmental issues a "social value" came in response to growing pollution related challenges in China, which are largely a by-product of industrialization and fast economic expansion. China's embrace of ecological civilization policies positions the country as a leader in the climate space. There was a marked shift in China's position on international climate

negotiations between the failed 2009 Copenhagen climate summit and the successful 2015 Paris summit. At the 2017 World Economic Forum's Annual Meeting in Davos, President Xi stated: "The Paris Agreement is a hard won achievement ... All signatories should stick to it instead of walking away from it, as this is a responsibility we must assume for future generations".⁵⁵

During the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP24) held at in Katowice, Poland, it was evident that several long time influential players are abdicating leadership on the issue of climate change. The United States has withdrawn from the Paris Agreement, Australia is not slated to meet its emissions targets and Brazil announced it would not host next year's COP25 summit as planned. China has moved in the opposite direction, stepping into this leadership gap and championing a concept over the past several years that it calls 'ecological civilization'. This concept not only has the potential to impact the global climate agenda, but may shape energy markets and strengthen China's broader geostrategic positioning.

China's leadership in the climate space could also have broader implications. Positioning itself as an effective climate leader would allow China, in visible contrast to the US, to wear a white hat on what is one of today's most important global challenges. Environmental preservation can be a 'value' for China to uphold and any successes in delivering on it can legitimize Beijing's governance practices. If China's centralized system of government proves better equipped to address it than a fractured liberal democracy (such as the US), then it could be harder for the global community to be critical of China's system of governance.

Geo-economic Impact of Ecological Civilization Policies. China's "National Sword" campaign in January 2018 banned the import of 24 types of solid waste, including most types of plastics. It aims to improve environmental conditions by cutting out a significant amount of high polluting, low end recycling. Since China imported two thirds of the world's exported plastic waste in 2016 this action was significant. It has forced developed economies to rethink their consumption and recycling systems fast.

China's investment in renewables has the potential to create lasting impact in the energy sector. China accounts for close to half of the global total. Five of the world's six largest solar module manufacturers and five of the largest wind turbine manufacturers are Chinese. While Chinese investment in renewables was up 58 percent in 2017 from the previous year, investment in the US dropped by 6 percent and in Europe by 36 percent. China has also become a major source of foreign direct investment, investing \$44 billion in renewable energy as part of its Belt and Road Initiative.

China has declared a "war on pollution" and introduced a number of green initiatives. Some of these initiatives are:-

- **Less coal, cleaner air.** China has taken steps to dismantle coal fired power plants, reduce overall emission levels and cut particulate matter emission rates. Huge progress has been made on air quality and there are now fewer smog days in China's largest cities.
- **Better regulation.** The former Ministry for Environmental Protection has been transformed into the Ministry of Ecology and Environment (MEE), a new entity with

broad, clearer responsibilities. The new ministry will oversee all water related policies, from ocean resources management to groundwater. Previously, these were scattered among different departments. The ministry is also in charge of policies on climate change.

- **Funding a greener future.** China needs an estimated additional \$6.4 trillion to \$19.4 trillion to finance the transition to a greener economy. It has started collecting an environment tax to help fund its environmental policies. It is also trying to attract more green investment.⁵⁶

However, China remains the world's leading carbon dioxide emitter despite its focus on improving the environment. Its air pollution contributes to more than 1.5 million deaths every year. The question remains as to whether China's ecological civilization policies will enable the country to continue to achieve strong growth in a way that reduces damage to the environment. But as this question is being answered, China, by virtue of taking the mantle of sustainability, may nonetheless be able to reap geopolitical reward.⁵⁷

Technological Innovations

As per President Xi Jinping's ambitious vision China is already on track to become an innovation powerhouse. Some of their technological innovations are discussed below.

Solar Power Plant. China is investing more in wind, hydro and solar power compared to other countries, Its 40MW floating solar power plant is the largest in the world.

Waste to Energy Plant. Scheduled to be operational by 2020, the Shenzhen East Waste to Energy Plant will use the most advanced

technology in waste incineration and power generation. It is expected to incinerate 5,000 tons of waste per day. The circular building will feature a 66,000 square metre roof and two thirds of it will be covered with photovoltaic panels. These panels will let the building generate its own sustainable supply of energy.

Alipay and WeChat Pay. China is home to two of the most powerful e-payment platforms globally. Ant Financial's Alipay and Tencent's WePay are estimated to each have more than 500 million active users and are the leaders of mobile payment in China. Because of the two platforms, most Chinese consumers have fully embraced the cashless lifestyle and said good bye to their wallets and credit cards. These mobile payment platforms are also expanding globally. PayPal, the largest US comparable platform company, has 244 million active users globally; and the US banking system overall is expected to have 161.6 million digital banking users by next year. While Tencent's WePay is largely linked to WeChat, Tencent's dominant messaging service, Alipay, has been quite visibly building partnerships outside of China especially in Southeast Asia. With the Chinese mobile payment market estimated at approximately \$5.5 trillion in 2016 and with 45 percent penetration of Chinese internet users, China is clearly the biggest e-payment market in the world

Trade War

US-China economic ties have expanded substantially since China's economic reforms in the late 1970s. US-China merchandise trade rose from \$2 billion in 1979 to \$636 billion in 2017. China is currently the United States' largest merchandise trading partner, its third largest export market and its biggest source of imports. US goods

and services trade with China totaled an estimated \$710.4 billion in 2017. Exports were \$187.5 billion; imports were \$522.9 billion. The US goods and services trade deficit with China was \$335.4 billion in 2017. US exports of Goods and Services to China supported an estimated 911,000 jobs in 2015; 601,000 supported by goods exports and 309,000 supported by services exports.

It is also important to note the value of China's trade in services. As China's economy has matured, the demand for services has grown. Between 2000 and 2017, the value of services imported by China grew from \$36 billion to \$469 billion. Much of these services come from advanced economies. In 2017, China's trade in services with the US totaled \$75 billion, which makes up between 10-12 percent of total trade between the two economic powerhouses. In contrast to their trade in goods, trade in services tips heavily in favor of the US. China imported \$57.6 billion in services from the US in 2017 while it exported only \$17.4 billion to the US.

Many US firms view participation in China's market as critical to their global competitiveness. US imports of lower cost goods from China greatly benefit US consumers. US firms that use China as the final point of assembly for their products, or use Chinese made inputs for production in the United States, are able to lower costs. China is also the largest foreign holder of US Treasury securities (at \$1.2 trillion as of April 2018). But despite growing commercial ties, the bilateral economic relationship has come under increasing tension. US policymakers and stakeholders have flagged the following issues:-

- China's cyber economic espionage against US firms.
- Ineffective record of enforcing intellectual property rights (IPR).

- Discriminatory innovation policies.
- Mixed record on implementing its World Trade Organization (WTO) obligations.
- Extensive use of industrial policies such as subsidies and trade and investment barriers to promote and protect industries favored by the government.
- Interventionist policies to influence the value of its currency which adversely affect US economic interests and have contributed to US job losses in some sectors.

The Trump Administration has taken a more aggressive stance against China to reduce US bilateral trade deficits, enforce US trade laws and agreements and promote “free and fair trade”. On March 8, 2018, President Trump announced a proclamation imposing additional tariffs on steel (25 percent) and aluminum (10 percent), based on Section 232 national security justifications (China is the world’s largest producer of both of these commodities). Since then number of actions have been taken by both the countries by imposing tariffs and restrictions.

US Vice President Mike Pence in a speech on US-China relations on October 4, 2018 stated, “America’s intention is to confront a rising China across the board: over its interference in American politics; over its trade and investment policies, alleged theft of intellectual property and plans for industrial development; over its cyber attacks; over security; over its debt diplomacy; and culture of censorship. The aim would be to reset America’s economic and strategic relationship

with China, to finally put America first”. These tit for tat actions continue though there is a temporary lull as on date. The trade war threaten to sharply reduce US-China commercial ties, disrupt global supply chains, raise import prices for US consumers and importers of Chinese inputs and diminish economic growth in the United States and abroad.⁵⁸ The Trump Administration has made MIC-2025 a major focus of its Section 301 actions including increased tariffs against China over its alleged distortive policies related to technology transfer, intellectual property and innovation.

An impression is created that the trade spat between the US and China is leading to the current economic slowdown. But China’s GDP is far less dependent on trade. China’s net trade surplus was only 1.7 percent of GDP in 2017, down from 8 percent in 2008. The effect may be more indirect, impacting consumer confidence and causing private sector companies to hold off on making decisions to invest in more manufacturing capacity.⁵⁹

Reality Check

China has lifted 850 million of its citizens out of extreme poverty over 35 years, its GDP per capita of just under \$9,000 which is not close to that of advanced economies. China still faces a host of poverty related issues. Tens of millions of Chinese still fall below the poverty line set by the Chinese government, which is defined as living on less than 3,000 yuan (\$453 in 2018) per year. Beijing has set in motion a series of policies designed to improve the socio economic conditions for its most impoverished citizens. Economic growth is a paramount priority for Beijing, given its goal to be a more powerful country by 2050.

China faces a number of major economic challenges which could adversely affect future growth, including distortive economic policies that have resulted in overreliance on fixed investment and exports for economic growth, government support for SOE, a weak banking system, widening income gaps and growing pollution. The Chinese government is aware of these problems. It addresses these issues by implementing policies to increase the role of the market in the economy, boost innovation, make consumer spending the driving force of the economy, expand social safety net coverage, encourage the development of less polluting industries and crack down on official government corruption.

Despite all the friction between China and USA both the countries have cooperated in various critical issues like:-

- Working together to boost economic stability in the aftermath of the global financial crisis.
- Addressing climate change.
- Bringing the Iran nuclear deal to fruition.
- Ramping up economic pressure on North Korea.
- Growing contributions to United Nations peacekeeping forces.⁶⁰

Financial Times columnist Martin Wolf explained that “China does not want to run the world. Internal problems are ... too big for any such ambition. In any case, it has no worked out view of what to do.”⁶¹ Due to the escalating trade war that the US has initiated, rapid population aging, high debt levels and maturity mismatches, China’s growth rate is likely to continue to decelerate. This will drain the

CPC's limited resources. For example, as the old age dependency ratio rises, so will health care and pension costs. Some of the problem areas of China are:-

- The Chinese economy may be far more efficient than the Soviet economy was, but it is nowhere near as efficient as that of the US. The clout of China's state owned enterprises (SOEs), which consume half of the country's total bank credit, but contribute only 20 percent of value added and employment is one of the main culprits.
- SOEs play a vital role in sustaining one party rule, as they are used both to reward loyalists and to facilitate government intervention on behalf of official macroeconomic targets. Dismantling these bloated and inefficient companies is difficult for CPC. Protecting them will invite grater challenge for the CPC.

Imperial Overreach

With massive trade surpluses bringing in hard currency, the Chinese government began to take on costly overseas commitments and started generous aid to countries - from Cambodia to Venezuela to Russia - that offer little in return. From 2000 to 2014, Cambodia, Cameroon, Cote d'Ivoire, Cuba, Ethiopia and Zimbabwe together received \$24.4 billion in Chinese grants or heavily subsidized loans. Over the same period, Angola, Laos, Pakistan, Russia, Turkmenistan and Venezuela received \$98.2 billion. Now, China has pledged to provide \$62 billion in loans for the "China-Pakistan Economic Corridor." That program will help Pakistan confront its looming balance of payments crisis; but it will also drain the Chinese government's coffers at a time when

trade protectionism threatens their replenishment. China is paying heavily for a few countries, gaining only limited benefits like the Soviet Union. The Sino American Cold War has barely started, yet China is already on track to lose.

China's technology sector has vulnerabilities. Globally oriented US industry has an advantage over a nationally focused China. Centrally directed economies are less efficient. Easy access to credit allows inefficient firms to survive, draining resources from more productive activities. Previous rounds of semiconductor investment in China saw new firms close after a few years. China's research and development expenditure, while growing, remains well below the likes of the US and Japan as a percentage of GDP. Despite the hundreds of billions of dollars targeted at technological advancement, China's research and development spending hasn't been effective. China is likely to miss its targets for R&D spending as a portion of GDP in the five year plan ending 2020. The nation will effectively end up spending \$100 billion less than it had budgeted.

In 2017, high tech manufacturing accounted for just under 13 percent of total industrial value added. More than half of China's technology standards for smart manufacturing don't match internationally accepted ones. China's expertise may have reached the second or third level, but it is nowhere close to the highest tier. China is still dependent on Western technology. China intends to end its dependence on semiconductors. Despite 40 years of investment and espionage, it is unable to make advanced semi-conductors. A look at the state of the new energy vehicle, or NEV industry suggests China is unlikely to race ahead. Domestic production is supposed to have an 80 percent share of the NEV market by 2025. For all the millions

of NEVs China now churns out, it is yet to produce a global or even a domestic champion. Instead, subsidies have led to swaths of low quality electric cars. Several would be “Tesla killers” have come and gone. Ultimately, China brought in Tesla itself to manufacture locally.

Despite the trade tensions and the apparent barriers, foreign investment in China has continued to pour in. In the first 11 months after the trade war began, it rose 1.1 percent to more than \$120 billion and the number of newly approved foreign invested enterprises increased by almost 78 percent. Funds going into the high-tech sector climbed 30 percent. Foreign investors aren’t overly concerned by Made in China - 2025. China’s openness to foreign investment has served it well — and overseas companies such as BMW AG, DowDuPont Inc. and Apple Inc. that have profited there. The country has a better chance of climbing the technology ladder by exposing its companies to the rigors of world class competitors than by seeking to shut them out with rhetoric heavy and substance light strategy documents.⁶²

While its emerging capabilities are still concentrated primarily on the Asia Pacific, Xi Jinping wants Beijing to “turn itself into a modernized power by 2035 and possess a top tier military by 2050.” As its economic interests grow more global, so does its military presence. China established its first overseas military base in 2017, in Djibouti. It is planning to build another one, near Pakistan’s Gwadar Port and intends to finance the construction of one in Badakhshan.⁶³

China’s overseas infrastructure projects will encounter local obstructions and increased competition from the United States and its partners. This will not, however, discourage Beijing from

redoubling its efforts on the Belt and Road Initiative. Concerns over enduring financial sustainability will result in a review of the initiative's projects in countries such as Pakistan, Indonesia and the Maldives. An increasing number of countries will try to negotiate better terms. Yet China's approach is flexible, particularly given its interests in making its state owned investors more financially prudent in their spending.⁶⁴

Chapter – 5: Comparison between India and China

India-China Gap

China and India are among the world's oldest civilizations. China and India accounted for a quarter and a third of total world economic activity during the first millennium AD. In the past 250 years this loss of relative economic size was rapid, as in Western Europe, the United States and Japan had brisk economic growth. Both China and India missed the Industrial Revolution and did not benefit from the rapid growth that came to the countries that pioneered and quickly adopted industrial production technology.

India won its independence from England in 1947 and Mao's communist revolution triumphed in China in 1949. 30 years ago the Indian and Chinese economies were roughly of the same sizes. Both the countries have similarly large populations. India in 1947 and China in 1949 chose two very different paths. India went the secular democracy way, while China embarked on the road to Communism with Chinese characteristics. In the beginning development strategy followed by both the countries was heavily influenced by Russia like five year industrial development plans marked by state control of the economy and self-independent trade policies. Seventy years later,

China is a veritable superpower and has lifted 300 million people out of poverty. In contrast, India is a rising middle power that has made comparatively moderate yet significant achievements in the various development sectors.⁶⁵

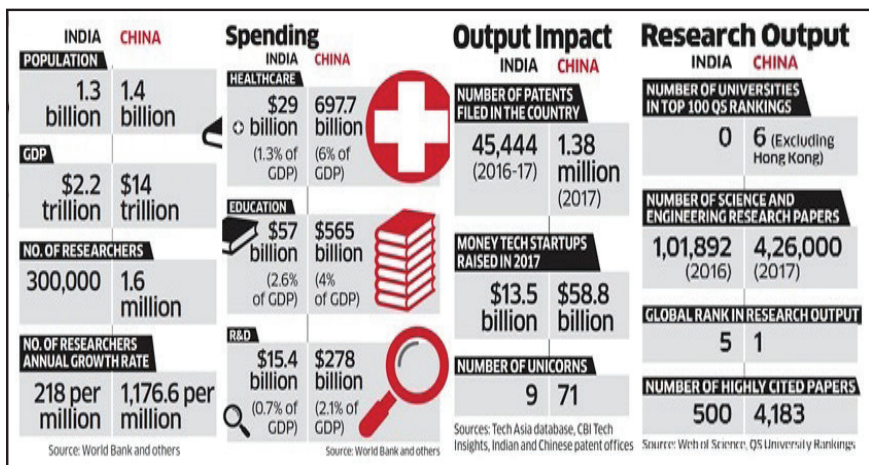
In the past 25 years China and India have been rapidly increasing their share of global gross domestic product (GDP). This is because they are tapping into global knowledge and integrating themselves more into the global economy. They are re-emerging as major global players. China began to move to a market economy and to open itself up to the rest of the world in the late 1970s. China is now a major global player on the world trade and investment scene. The speed, scope and scale of its entry into the global system are unprecedented in economic history. It has been growing at 8 percent to 10 percent per year since the late 1970s.

India started opening up its economy by relaxing its tight grip on the private sector in the late 1980s. Its rate of growth began to increase. However India suffered a major financial crisis in 1991. India had to undertake measures like trade liberalization, loosening of the controls on business and some gradual opening to direct foreign investment to overcome the crisis. These measures boosted its rate of growth from an average of 2 percent to 3 percent since independence to 6 percent in the 1990s. Since the turn of the century, India has taken further actions like liberalization of business regulations, trade and openness to foreign investment causing increase in rate of growth. Much of this recent growth has been driven by its rapid expansion of information technology (IT) enabled services, business services, commerce and banking. Internationally, India has acquired a reputation as the IT enabled service center of the world.⁶⁶

Till about late 1980s, there would not have been much difference in their science and technology capabilities of India and China. But in the 1990s, China invested heavily in education and research and started moving ahead very quickly. It has continued this thrust ever since. China is close to the US, the world leader in science and technology. It has already caught up in quantity, though it has some catch up to do in quality. Presently India and China are poles apart in science and technology infrastructure.

India's top five information technology companies, from the Fortune India 500 list (2017), are yet to make the kind of impact Chinese fast growing Internet technology firms have. India's top software services companies, Tata Consultancy Services, Infosys and Wipro chalked up revenue of \$18.55 billion, \$10.91 billion and \$8.81 billion in 2017, respectively. In contrast, China's Huawei Investment and Holding, JD.com, Alibaba Group and Tencent Holdings recorded comparatively higher revenues of \$78.51 billion, \$39.16 billion,

How India and China compare in the knowledge economy?



\$23.52 billion and \$22.87 respectively.⁶⁸ India's continued progress in expanding services trade. India's information technology services market is a world leader, contributing to a total services trade of \$325 billion in 2018, with a solid \$76 billion surplus in this period. India's goods trade also continues to grow, albeit unevenly. In 2018 India had \$832 billion in total goods trade, though with a \$184 billion trade deficit. Looking at goods and services combined, India's trade equates to around 40 percent of the nation's GDP.

And looking purely at goods trade, China has a higher trade to GDP ratio than India. But if we were to add services to the mix, the ranking flips—India has a higher trade intensity, 40 percent to 38 percent. In fact, India's trade ratio also ranks higher than the United States and Japan, though trails Germany, the United Kingdom and France among the world's largest economies. China's gross domestic product today is nearly five times higher than India, \$12 trillion to \$2.5 trillion, so the denominator makes a difference.

There is a widening gap between the perception and reality in terms of India's progress on trade integration. The Indian government is regularly taking policy decisions that should cause self-isolation on trade. But irrespective of government choices, India appears to be on a growth path that is trade oriented. In fact, India ranks in the exact middle among the world's largest economies in terms of trade to GDP ratio.⁶⁹

Advantages of India and China

India	China
<p>Young Population. With a median population age less than 30 and almost 1 million people entering the workforce every month, India provides the right environment for young first time job seekers to explore opportunities in Indian manufacturing sector, consumer electronics, automotive, aeronautics and aerospace.</p>	<p>Agility. Quick turnaround times for manufacturing, growth of the digital mobile payments sector, rapid growth of the solar energy renewable sector is evidence of why China will continue to dominate the sectors it heavily invests in.</p>
<p>Skilled workforce. With a strong high school and university ecosystem, Indian students are sought after by multinationals the world over. Fast changing times and a slow to adapt education system, have made many skills acquired in universities redundant in today's job environment. Government and private industry's efforts to set up reskilling and upskilling centres to increase employability is a welcome move.</p>	<p>Favourable Policies for Renewables. China as a world leader in the pursuit of a cleaner environment. As European nations struggle to reach a consensus on renewable energy policies and other BRICS nations prepare their long term policies for the renewable sector, China is already far ahead and implementing at scale.</p>
<p>Favourable Policies. The 'Make in India' programme and policy is India's plan of action to encourage Indians to create products for the world market. India has the resources, policy and workforce in place. Relaxed FDI policies and better protection for companies' intellectual property, coupled with industry favourable government policies have created competition amongst Indian states to attract foreign direct investments in the manufacturing sector.</p>	<p>Economies of Scale. China's renewable energy adaption, its investment into large scale manufacturing hubs and its export focused economy, are all factors that will continue to make manufacturing cheaper in China and ensure the world's dependence on Made in China products. The Chinese government ensures local companies keep their cost of goods sold low, volumes high and profits healthy.</p>

Large population base ready to go digital. 1.3 billion people, the growth of mobile payments, the emphasis on ‘Digital India’ and action by the government to root out unaccounted money from the system are all driving Indians to fast adapt to the use of digital payments. This sector is set to see rapid growth. The government of India has also started efforts to digitally connect the country by offering small businesses a Unified Payment Interface (UPI), a zero cost payment gateway.	Fast establishing global presence. The government’s encouragement of exporters has created many Chinese global brands, which are set to be market leaders in their fields. Xiaomi, Oppo, One Plus, Lenovo and DJI are Chinese brands that have the fastest growing market share in the Indian consumer electronics market. Alibaba’s increasing presence in India through its strategic partner PayTM, China has created a channel to create new overseas markets for Chinese manufactured products.
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IT and Telecom Sector

China’s \$ 11 trillion economy is almost five times that of India. China is way ahead of India in terms of technology in IT and telecom sector. India has miles to go before it seriously challenges Chinese leadership. China is emerging as a technology leader not only of the emerging nations but at the global scale. China is way ahead of India economically as it initiated economic reforms at least one decade earlier. Besides its current obsession of technological leadership will propel it further. Though India has slight advantage in growth rates, it needs more strategic thinking to catch up.

Chinese software industry is already bigger than that of India’s which is one of the India’s biggest achievement. China has created Baidu, Weibo and Renren which imitate functionalities of Google, Twitter and Facebook respectively. It has also developed an Operating System called Kylin. India is yet to make a mark here. China is home

to global brands in PC, mobile phones and network equipment manufacturing e.g. Lenovo, Xaomi, Oppo, Huawei, ZTE etc. Indian companies are no where in comparison. Though India has a pool of chip designers, chip fabrication is non existent in India. China is aiming to achieve global leadership in a decade and as many as 20 fabs units are under construction. China is a force to reckon with Artificial Intelligence, Robotics and drones manufacturing. In these areas India has no global visibility. Chinese telecom giant, i.e. Huawei is contributing to evolving 5G networks. India is likely to remain an implementer here.

In certain emerging technologies the gap is more wide. China owns the world's fastest and the second fastest supercomputer. It has 160 machines in the list of 500 while India has four. China demonstrated space based entanglement in the nascent Quantum Key Distribution (QKD) technology using its own satellite, Micius which could enhance security of Internet. India has hardly any competence in this field. Chinese scientists have also demonstrated a prototype quantum computer which may beat classical computers in future. China's efforts in fast trains, aircraft manufacture, development of aircraft carriers, electric cars, higher end telescope, genomics etc. implies that it learns IT and controls systems in these areas etc. India lags China in these technologies and hence in the associated IT and control systems. Overall as per World Intellectual Property Organization, in 2015, China filed the most number of patents. India was at number 14.⁷⁰

China exported \$2.16 trillion worth of goods to the world in 2017, compared with India's \$299.3 billion, according to the Central Intelligence Agency's (CIA) World Factbook. According to CIA's

World Factbook, China generated 6.14 trillion units of electricity in 2016. In comparison, India generated 1.15 trillion units of electricity in same period. China produced 24.4 million passenger cars and 3.6 million commercial vehicles in 2016, compared with India's 3.6 million passenger cars and 0.81 million commercial vehicles, according to statistics from the Organization Internationale des Constructeurs d'Automobiles (OICA).

The gap starts narrowing in the next set of indicators. Internet penetration in China stood at 772 million at the end of 2017, while in India it was 462 million. India is close to China in terms of its land transportation network. At the end of 2017, India's railway network was just 3,000 km short of China's 124,000 km. However, China's railway network includes 22,000 km of tracks for high speed trains, while India has none. In the road network, India is higher at 4.7 million km versus China's 4.6 million km at the end of 2015.

China is also far ahead in terms of research and development. In 2017, China spend about 2.1 percent of its GDP on R&D, while India spends less than 1 percent. According to the World Intellectual Property Organization, China applied for about 1.34 million patents in 2016, which was 42 percent of the total patent applications made worldwide, while India (both resident and non-resident Indians) filed for 45,057 patents. Nilanjan Banik, professor of economics at Benett University and a long time China watcher said, "While it is true that you can buy the latest technology off the shelf, but the real question is whether we have the necessary wherewithal to use these new technologies like artificial intelligence, big data etc. Given the current status of Indian education it seems highly unlikely".

Demographic Dividend

China and India are the world's two most populous countries. India's current rate of population growth is about twice that of China (1.55 percent annually, versus 0.66 percent for China) and its total population will equal China's in 2025 (about 1.4 billion in each country), thereafter exceeding China's. The Indian population will continue increasing through at least 2050, while China's will peak at about 1.5 billion in 2032, declining thereafter. The outlook for India's long term growth is positive due to a young population base, low dependency ratio, healthy savings and investment rates. The median age for India is 27.6 years while its 36.1 years of China. China's 'one child policy' which was relaxed last year has made it one of the most rapidly aging countries in the world. Elderly dependency ratio for China is 13 while its only 8.6 for India. China's population is generally healthier than India's and China has the benefit of a more developed health care system. China's population is aging more rapidly than India's. India will have a lesser cost burden from this source because of its younger population.

China's population has higher average levels of literacy and education than India's. If India can successfully meet this challenge by investing in human capital, it may be able to turn a disadvantage into an advantage through productive employment of its growing pool of younger workers. However, whether India's several demographic advantages—increasing numbers, younger age cohorts, declining dependency ratios—will be a dividend or drag on future economic growth will depend on the extent to which productive employment opportunities emerge from an open, competitive, innovative and entrepreneurial Indian economy. Conversely, whether China's

several demographic disadvantages—rapidly aging population, rising dependency ratios, rising health costs for the elderly, sharp gender imbalances—will be a drag or a dividend will depend on the extent to which these demographic circumstances provide a stimulus to improving technology and to raising the skill and productivity of a shrinking labor force.

India has been taking notable steps forward in innovation, supported by Prime Minister Narendra Modi's reform agenda. Government schemes have been unveiled to boost the country's innovation and technology sectors such as Digital India, which expands the country's online infrastructure and Startup India, which promotes financial backing for entrepreneurs. Meanwhile, the country's growing information technology and scientific expertise have also helped turn it into an increasingly dominant outsourcing hub.

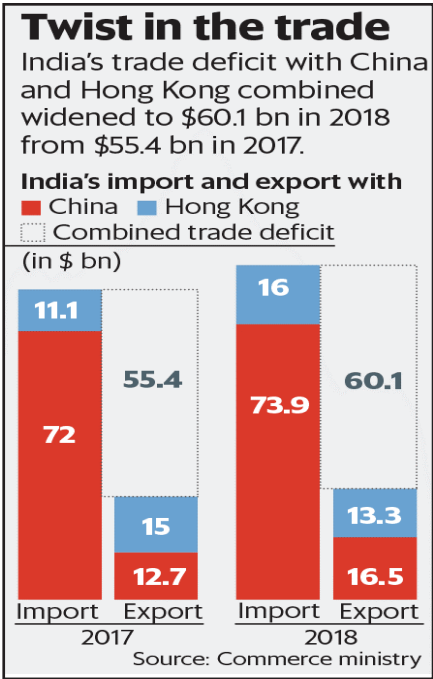
India's recent efforts to shore up its domestic defence manufacturing industry, develop a regional satellite for South Asia and a home grown GPS, as well as establish 20 world class universities, are all steps in the right direction. India needs to identify focus areas, analyse what kind of role it can play and where the state can make tactical investments overseas. India needs to build the infrastructure which can generate new technologies. It needs to invest in human capital, maintain a cadre of top scientists and professionals and develop industry lab links. The Government of India should enforce regulation that improves user data privacy and demand data localization with guidelines on cross border data transfer. This is critical if India is to realise the benefits of growth and innovation while also guarding against security risks.

Chapter – 6: Chinese Involvement in Indian Economy

India-China Trade

India's relationship with its biggest trading partner, China, has been a 'buy-buy' – Indian hunger for Chinese machinery and equipment. In return, India exported low grade ores to China. A trade surplus in China's favour has now crossed \$50 billion out of two way trade of around \$85 billion. India's trade deficit with China has come down by \$10 billion, from \$63 billion in 2017-18 to \$53 billion in 2018-19. It has narrowed on the back of India's growing exports and contracting imports: While exports grew 30 per cent between 2017-18 and 2018-19 to \$17 billion, imports contracted by 9 per cent to \$70 billion. China is India's biggest trading partner, but also the biggest contributor to India's trade deficit.

The broad sectoral trends of the exports of China and India is that primary commodities had a significant share of India's exports, which is consistent with China's strategy to source raw materials from its trading partners. In the absence of adequate manufacturing facilities that could have helped in processing the increased production of raw materials and intermediates, these products are being exported and India is foregoing domestic value addition. The US-China trade war also helped, with Indian exports to China such



as pharmaceuticals, auto components, plastic products and organic and special chemicals, besides agricultural products like soybean, rapeseed and sugar, picking up.⁷¹

Imports from China are primarily in two commodity groups — electrical and electronic equipment and pharmaceuticals. In 2017-18, almost 60 per cent of India's import requirements of electrical and electronic equipment were met by China, as were more than 75 per cent of the active pharmaceutical ingredients, the raw material used by India's generic pharmaceutical industry. China supplied more than 80 per cent of the antibiotics imported by India. These key sectors of the Indian economy are critically dependent on China.

With the government failing in its attempt to incentivize “making” in India, increased exports to China should, therefore, be seen as

a stream of opportunities missed for creating jobs in the country and adding additional incomes in Indian hands.⁷² However, India's imports from Hong Kong have risen significantly for the same products that India imports from China. During 2018, India's trade deficit with China narrowed to \$57.4 billion from \$59.3 billion, while India's trade surplus with Hong Kong valued at \$3.9 billion in 2017 turned deficit at \$2.7 billion in 2018. India's trade deficit with China and Hong Kong combined widened to \$60.1 billion in 2018 from \$55.4 billion in 2017. China is capable of manipulating such data. India should be careful with China and consider China and Hong Kong as one country while calculating trade figures.⁷³ While the focus of India's current trade strategy with China is to bridge the gap, chiefly by increasing exports of agricultural commodities hit by the China-US trade war, Beijing's priorities have shifted elsewhere.

India has opened doors that had long remained closed in Beijing, particularly as China looks to diversify sources of agricultural commodities such as soybean and rapeseed. In Wuhan, Prime Minister Modi also pressed Xi on opening up the market to Indian rice varieties, in addition to sugar and pharmaceuticals. Pharmaceuticals and IT are two areas where India believes a range of non-tariff barriers have all but blocked the entry of Indian companies which have achieved success elsewhere.

India's Trade and Investment Strategy

India has primarily two areas of focus – opening up China's market, particularly for IT and pharma and bringing in Chinese investments in greenfield infrastructure projects in India and to manufacture in India. Both proposals does not suit the interests of China. Consider

IT and pharma. China is seeking to develop and acquire the capacities on its own in both areas, including through acquisitions. Example is Fosun's \$2 billion acquisition of Indian company Gland pharma. Only Indian IT company to be successful in China is NIIT, which isn't selling Indian IT services or products, but training tens of thousands of young Chinese in IT skills every year, so they can bolster Chinese IT companies rather than rely on Indian ones.

Faced with its trade war with the US, China has for the first time demonstrated some intent of addressing some concerns. In May last year, China removed tariffs on 28 anti-cancer drugs. Indian pharma companies feel that this is too little too late. It is the difficult non-tariff barriers that are the real obstacle. They are skeptical of any real reforms. There is a demand to raise duties on many of the major Chinese imports such as electrical machinery. But in doing so, India faces a double edged sword. The duties on solar cells are a case in point. India has an ambitious target of expanding solar capacity, limiting imports from China, which is the only country that has the scale and cost effectiveness to enable this expansion. This will come at a price.⁷⁴

Effect of US-China Trade War on India

Many Indian companies are also viewing Beijing's Made in China - 2025 plan to upgrade its industries and technological capacities as an opportunity, rather than the threat it is viewed as in the West. There are both short and long term opportunities for India. Should Beijing relent to Western demands of creating a level playing field and curbing forced technological transfers, India, too, stands to gain. In the short term, Indian IT companies are already working with local

Chinese governments – starting with Guiyang in Guizhou province and Dalian in Liaoning – to boost their capacities particularly in big data and artificial intelligence.

Both governments have launched a joint IT matchmaking initiative called the Sino-Indian Digital Collaborative Opportunities Plaza to help Chinese companies address their software needs as they upgrade under the “Made in China 2025” plan. At the launch, then Indian ambassador to Beijing Gautam Bambawale said Indian companies were “uniquely suited” in helping Chinese firms implement their initiatives in big data, AI and Internet Plus, the latter an initiative to move the Chinese economy toward services and the tech sector. India’s National Association for Software and Services Companies has placed “Made in China 2025” at the centre of its current IT outreach plans for China. This is a work in progress.

As China seeks new markets particularly for agricultural commodities the trade war has opened up windows for India that years of trade diplomacy failed to do. Beijing is appearing to course correct, at least in the short term. India will look to seize short term opportunities even as it deals with the longer term challenge of China’s rise. China ended 2018 with an effort to make peace with its neighbours as it dealt with rising competition with the US, evinced in both the Wuhan summit and the visit of Japanese Prime Minister Shinzo Abe. This course correction could, in the short term, yield dividends for India, but whether it is merely tactical remains to be seen.⁷⁵

China, under pressure from the trade war with the United States, coupled with increasing backlash to Chinese companies across the West and a slowing economy at home, is looking to mend fences and

repair relations. Donald Trump's maverick anti trade moves have made China apprehensive and uncomfortable. Many of China's top businesses are convinced that even if the trade war ends, the Western world will still be determined to put roadblocks in their way. As the trade war dragged on, Chinese companies which hadn't considered India earlier decided to start factories in India.⁷⁶

The Indian government sees 'a window of opportunity' to expand India's exports because of the trade war and retaliatory tariffs placed by China, particularly on several American agricultural commodities. India has already discussed exporting soyabean and signed a protocol of phytosanitary requirements to export tobacco leaves. The trade war certainly holds the promise of some trade advantages for India, at least in the short term. But whether the benefits would likely be somewhat offset by the general slump in China's appetite for imports on account of its troubled economy remains far from clear.

There is a lot of potential in trade and investment front that remains untapped. For two economies the size of China and India, there is remarkably little in the way of close engagement or interdependence. It's still largely a buy sell relationship and one dominated by China. One area where that's beginning to change is the tech space. China has promised to address the trade imbalance by increasing imports, particularly in the pharmaceuticals sector and in working together on infrastructure projects in third countries. Nothing much has happened.

As far as moving production out of China, there are other countries better placed than India to benefit. Malaysia was most likely to benefit, followed by Japan, Pakistan, Thailand and Philippines, based

on analyzing specific products that China had placed tariffs on. Even when it comes to switching production out of China—which was based on FDI attractiveness and a survey of multinational companies Vietnam would be the clear winner. India was placed fourth, behind Malaysia and Singapore.

Chinese Investments in India

China is increasingly seeing immense opportunities in India as a market. Chinese companies in any sector find India is the only market that has the possibility of being as big as the Chinese market. No other market comes even close. The Chinese have been getting into the Indian business arena aggressively for some time. The Chinese are dominating industries like mobile phones and are about to grab the lion's share of the television and home appliances industries. Data is the new oil. The Indian market is only second to China's in terms of its offerings. In data security India has one of the poorest regulations and protections. A combination good for China, less so for us.⁷⁷

China is now emerging as one of the biggest investors in Indian start ups and closing the gap with the US and Japan. Companies like Alibaba and Tencent are major shareholders in many of India's biggest start-ups. Alibaba bought into Snapdeal and Paytm via multi hundred million dollar investments in 2015 and the pace has only quickened since then. In 2017, Tencent invested in Gaana (music streaming) and Swiggy (food delivery) in major deals, having backed Byju's (education) and Ola (ride hailing) the year prior. The pair also launched local cloud computing services inside India last year. Beyond those two, Xiaomi has gone beyond selling phones to back

local companies and develop local services for its customers. Their sharing of technological expertise is also helping them scale up. This influx of Chinese capital close to \$10 billion, by some estimates could change the nature of economic engagement by China with India.

As everything in China is regulated, Chinese companies are used to regulation. The Chinese companies can adapt to Indian regulations very fast. Example is how quickly Alibaba backed PayTM has pivoted to take advantage of either changing regulation or policy void. Chinese companies, with their experience of working around rigid regulation in China and their investments in “Indian” tech companies, will be better placed to deal with India’s not very comprehensive tech regulations to come up shortly.

Investment in IT sector

Since 2015, around \$7 billion in Chinese funding has poured into the Indian technology sector. Chinese companies are now major shareholders of some of India’s biggest tech companies. Chinese tech companies have over the past two years also launched ambitious tailor made products for the Indian market. Chinese apps launched in India have many commonalities like:-

- Deep pockets for marketing expense.
- Focus on vernacular India users.
- An addictive user interface.
- Racy content.
- Quick iterations and execution cycles.
- Cheap offerings.

Just two of China's three big BAT (Baidu, Alibaba and Tencent) technology firms – Alibaba and Tencent – have invested close to \$3 billion in various Indian start ups. The third of the group, Baidu, has been slower off the mark. The investment is in diverse fields. According to a KPMG study, from 2015 till 2017 end, the biggest sectors have been e-commerce (\$3 billion), transportation (\$1.7 billion), fin tech (\$750 million) and travel (\$450 million). In 2015, Alibaba pumped in close to \$700 million in Paytm's parent company, giving it a 40 percent stake. Alibaba also has investments in Snapdeal and Zomato, while Tencent has invested in Ola, Flipkart and Practo. Similarly, travel portal C-Trip took a key stake in MakeMyTrip. Alicloud is building its second cloud storage centre in India. At a different level, ShareChat has large investments from Xiaomi Singapore and Shunwei Capital.

The Great Firewall of China has kept the US digital giants at bay. But Chinese digital giants are competitive and ahead of the global giants in many ways. The messaging app WeChat had payment options years before WhatsApp launched it. Chinese companies like Bytedance, which is behind Tiktok and the widely popular Chinese original, Douyin, is among many that see India as the next big frontier. China uses the successes of its e-commerce experience to help Indian companies to scale up in a similar way. Chinese entrepreneurs understand the nuances of the India market. To capture Indian vernacular content market. ByteDance has a local team entirely based in New Delhi.⁷⁸

A report from Factor Daily found that 44 of the top 100 Android apps in India were developed by Chinese companies, up from just 18 one year prior. The focus is on Android because it is the overwhelming



Image Source ⁷⁹

choice of operating system among India’s estimated 500 million internet users. The list of top Chinese apps includes major names like ByteDance, the world’s highest-valued startup, which offers TikTok and local language news app Helo in India and Alibaba’s UC browser, as well as lesser known quantities like Tencent backed News Dog and quiet yet prolific streaming app maker Bigo. Citing data from Sensor Tower, the report found that five of the top 10 Android apps in India are from China, up from just two at the end of 2017.

Mobile Phones

Xiaomi is already well entrenched in the Indian market. It boasts revenues of ₹23,000 crore and is the leader in mobile phones with a 29 per cent market share. Xiaomi's revenue grew by around 150 per cent in 2017 and it has also captured a large share of the television industry by slashing prices on what it says are quality products.

Electronics, Home Appliance, Automobile and Tech Sectors

In technology, China doesn't consider India as competitor at all. It has set its eyes on toppling the US's dominance in every aspect of technology. The irony today is that US has begun buying robots from China. The International Federation of Robotics says that 40 per cent of global robotics sales will be by China. Chinese investments in India in the field of electronics, home appliance, automobile and tech sectors are rising rapidly. It's been a huge coup for Andhra Pradesh Chief Minister N Chandrababu Naidu. Sri City, Andhra Pradesh is in contact with 10-15 major Chinese conglomerates that are showing interest in making large investments. Chinese firm TCL, has selected Naidu's showpiece electronics hub at Tirupati to make a ₹2,200 crore investment in two plants that will turn out mobile phones and television screens. TCL grew 120 per cent in the last year and has major plans for the Indian market. Narendra Modi, when he was Chief Minister of Gujrat, had been visiting Shanghai for getting investments to his state. Today number of states are eager to invite Chinese investment in their respective states to augment their economies. The Government of India has a sensitive task to oversee the security aspects as well as the overall economic plan of the Government.

Xiaomi has entered multiple new segments like power banks in which it's the market leader. Other newer products include a range of smart devices, including air purifiers, sound bars for televisions and accessories that connect to smartphones like bluetooth headphones. There are companies like Haier, TCL and Midea Group, which are Chinese but sell Toshiba branded products. Haier is investing over ₹3,000 crore to build a new plant in Greater Noida that will make two million refrigerators and a million each of washing machines, air conditioners and televisions. Midea, investing some ₹1,300 crore to make air conditioners in partnership with Carrier and a range of other household appliances. Earlier, in 2017, the Midea Group invested ₹800 crore in a new plant in Pune.

Indians, in earlier years, had reservations about Chinese brands but that seems to have been overcome by the new wave of products from companies like Xiaomi, TCL and Haier. In the auto industry, though, it's a different story. Companies like Shanghai based SAIC Motor are using the MG (Morris Garage) badge to overcome customer reservations. The company's ads stress the MG name and its vintage British heritage. Similarly, the company that makes Volvo vehicles that sell in India is owned by Hangzhou based Zhejiang Geely. The company stresses its original Swedish parentage.

One automobile company that's happy to come to India using its own distinctly Chinese brand name is bus company BYD Auto Industry, the world's largest electric vehicle company in partnership with a local company. It has already won contracts in several cities for its electric buses. Crucially, but unsurprisingly, the three automobile companies have brought also a large clutch of Chinese automobile component companies. Many Chinese companies are using a ploy

of coming into India under cover of a Swedish or Japanese brand name successfully. Miniso, a Chinese retail chain uses the name of a Japanese retailer that it bought some years ago.

India's Options

Digital India

India is one of the largest and fastest growing markets for digital consumers, with 560 million internet subscribers in 2018, second only to China. Indian mobile data users consume 8.3 gigabits (GB) of data each month on average, compared with 5.5 GB for mobile users in China and somewhere in the range of 8.0 to 8.5 GB in South Korea. Indians have 1.2 billion mobile phone subscriptions and downloaded more than 12 billion apps in 2018. India is digitizing faster than any other country except Indonesia.

India is among the top three global economies in number of digital consumers. The figures are staggering:-

- India is the second largest internet subscriptions market in the world, with 560 million internet subscriptions in 2018, up from 238.71 million in 2013.
- India has the second largest number of instant messaging service users worldwide, behind China.
- India is the most social media users.
- Aadhaar, India's unique digital identity programme, covers more than 1.2 billion people, the largest system of its type globally.

India will increase the number of internet users by about 40 percent to between 750 million and 800 million and double the number of smartphones to between 650 million and 700 million by 2023.

Digital applications could proliferate across most sectors of India's economy. By 2025, core digital sectors such as IT and business process management, digital communication services and electronics manufacturing could double their GDP level to \$355 billion to \$435 billion. Newly digitizing sectors, including agriculture, education, energy, financial services, healthcare, logistics and retail, as well as government services and labour markets, could each create \$10 billion to \$150 billion of incremental economic value in 2025 as digital applications in these sectors help raise output, save costs and time, reduce fraud and improve matching of demand and supply. The productivity unlocked by the digital economy could create 60 million to 65 million jobs by 2025, many of them requiring functional digital skills. Retraining and redeployment will be essential to help some 40 million to 45 million workers whose jobs could be displaced or transformed.⁸⁰

Even after these advances, India still has plenty of room to grow in digital terms. Just over 40 percent of the populace has an internet subscription. Despite the growth of digital financial services, close to 90 percent of all retail transactions, by number, are still in cash. Only 5 percent of trade is transacted online, compared with 15 percent in China in 2015. Rapid advances in automation technologies are affecting India's information technology and business process outsourcing sectors. These sectors have remained net job creators. It is estimated that companies could hire up to three million more workers by 2025, provided they can acquire the skills to meet

changing needs. It is time for India to set clear and aggressive goals for developing strengths in technology. India's technological prowess is limited to being the back office to the work. But even that edge is diminishing since body shopping based service models are collapsing. The Indian IT sector has been grossly negligent in not investing in new platforms like IoT, AI and 3D printing. India has a negligible presence in robotics even though domestic users are keen buyers.

The global rise of independent work and micro entrepreneurship, aided by new digital ecosystems, is mirrored in India, where they are providing new work opportunities with better pay and links to organized value chains, including in parts of the country less covered by formal labour markets. The rapidly growing sectors of cab hailing platforms, e-commerce, digital financial services through networks of banking correspondents and lending for micro entrepreneurship and self help groups have improved income opportunities for 18 to 22 million workers in about the past three years.

Manufacturing

Manufacturing in India faces problems of poor infrastructure, red tape, disconnectedness from global supply chains and restrictive labor laws. However, India's auto industry is a success story. The days of Ambassador and Premier Padmini are over. With an output of nearly 3.8 million cars a year, India now nearly matches South Korea, an automobile powerhouse and is on track to catch up with Germany. If automobiles and by extension manufacturing more broadly, take off in India, the country may be able to generate many of the jobs required to employ the 12 million new entrants to the labour market each year. If manufacturing fails to thrive, India's economic future

could come into question and along with it the country's dream of emerging as a global power.⁸¹

There are question marks about India's manufacturing prospects vis-à-vis global technological and economic trends. Some of the issues are:-

- Whether a focus on manufacturing can bring prosperity.
- Rise of automation has raised quality standards and productivity, but at the cost of jobs.
- Rise of 3D printing could affect supply chain considerations.

Harvard economist Dani Rodrik has flagged concerns about the prospect of 'premature deindustrialization'. There can be a downturn in the share of manufacturing in developing countries well before their economies match those of wealthier nations. Rodrik attributes this in part to the effects of trade and globalization—competition from China and other major manufacturers on the global market—which suggests that India would have a hard time patterning its growth on China's labor intensive strategy.

Ruchir Sharma of Morgan Stanley's, notes in his *Rise and Fall of Nations* that the robotics revolution states that it is likely to be gradual enough to complement rather than destroy the human workforce. New jobs will help fill the gap. Development institutions like the World Bank, along with management consultancies like McKinsey, continue to see opportunity for India to do more to reform laws and policies that inhibit manufacturing's growth, whether for the domestic market or for export. In 2016 McKinsey Global Institute issued a set of recommendations that included "Manufacturing for India, in India" in its top five "opportunities for growth and transformation."⁸²

To bridge India's infrastructure gaps, the government of India has taken some initiatives. It raised public investment in roads, railways, rural development, power, telecom, housing and "soft" areas of health care and education, creating work opportunities for an estimated seven million workers, at wages that are 70 percent higher than for average farm workers.

India's Sensitivity

Strategic security in the new world is not limited to defence capabilities any more. India has to counter China as a technology giant which has tremendous focus on cyber abilities. China is not just creating a huge cyber economy for itself, but also has empowered itself with cyber warfare abilities. India's policy makers may be alive to the China challenge but have not placed technology on the same pedestal as defence related security. India did well by opposing the Belt and Road Initiative (BRI). India must factor in technology as a critical dimension of competition and cooperation. A country that is weak in technology will not be able to be a global superpower, let alone a regional power. In the neighbourhood, China has encircled India with its investments in Pakistan, Bangladesh, Nepal and Maldives. Its technological strengths in the next decade would help it undermine India at a global level.

Chinese investment in India has benefits. The infusion of capital has allowed hundreds of Indian start-ups to scale up, thanks to their financing. In some sectors it is a welcome development. But the IT industry is changing rapidly. If we consider banks to be strategically sensitive assets, is it only a matter of time before online wallets that are increasingly offering all of the services that banks do, fall in a similar category.

Regulation

There are wider, longer term concerns of Chinese companies acquiring controlling stakes in certain start-ups in different sectors. How do we regulate the process? Are we okay with Alibaba, a Chinese company with close ties to the state, essentially being the biggest shareholder in India's biggest online wallet? What guarantees do users have that their data isn't finding its way to Hangzhou? Would we be okay with the Chinese state being the biggest shareholder in Paytm? There is a need of a transparent, predictable and fair regulatory framework which does not differentiate between foreign investors based purely on nationality. This can be along the lines of what other countries have. This is not a China specific problem. The question of security applies to all companies and not just overseas ones. It is an Indian problem of how to ensure transparent regulation. Often in the rush for financing, the question of regulation has been all but ignored.

There are few safeguards for data security. Consider the case of the Alibaba owned UC Browser, which has a 50 percent market share in India and is used by more than 300 million people. The company was recently forced to issue a clarification after government reports suggested that Indian users' data was not entirely being stored in Indian servers.⁸³

Regional Comprehensive Economic Partnership (RCEP)

The RCEP aims to create a free trade zone of 10 ASEAN nations and Australia, China, India, Japan, South Korea and New Zealand. This means a zero-customs duty zone in a geography that contributes 34 percent of global GDP and 40 percent of world trade. The region is

also home to almost half of the world's population. The grouping will have immense economic clout. A sense of exuberance was visible among the members of the proposed group in mid-November 2018 at Singapore, which had hosted the summit level talk of the RCEP nations. Prime Minister Narendra Modi, participated in the event. He said India was committed to early conclusion of the agreement.⁸⁴ Once concluded, this multilateral agreement will be the next biggest trade pact after the agreement on Arthur Dankel's draft to upgrade General Agreement on Tariffs and Trade (GATT). The progress of the partnership is being closely monitored by most trade observers globally, especially when considering the US China trade war.

As on 2017-18, India has a trade deficit of \$63.1 billion with China. India has trade deficits with other RCEP nations, also such as South Korea (\$11.9 billion) and Australia (\$10.2 billion). 65 percent of India's goods trade deficit in 2017-18 was with RCEP Nations. RCEP may increase India's trade deficit further. India's trade with members of RCEP countries is given below (In \$ billion).

	India's export to	India's Import from	Total trade	Deficit
China	13.1	73.3	89.4	63.1
Asean	33.8	47	80.8	13.3
S Korea	4.4	16.4	20.8	11.9
Australia	3.8	13.9	17.8	10.2
Japan	4.7	10.9	15.7	6.2
New Zealand	0.35	0.64	0.99	0.29
RCEP	60.2	165.2	225.4	105

	Export	Import	Total trade	Deficit
India's global trade (\$ bn)	300	461.2	761.4	161.4
Share of trade with RECP	20.1 percent	35.8 percent	29.6 percent	65.1 percent

India's Concerns

Talks for RCEP have been underway for over six years now but India is seen to be holding up a deal, given its worry over cheap imports entering the country and wiping out several sectors. RCEP, can derail India's 'Make in India' programme. The partnership will have an impact on sectors such as steel, pharmaceuticals, e-commerce, food processing, agriculture, intellectual property and food security. India wants to develop some of these sectors in the domestic market. India's major concerns are:-

- The presence of China creates apprehensions, when it is well documented that the country enjoys manufacturing surplus and is already dumping its products across the world, including in India.
- Apart from China, India is also losing out to financial and technological hub of Singapore, agriculture and dairy majors Australia and New Zealand, plantations of South East Asian countries and pharmaceutical trade with China and the US.
- With e-commerce as part of the discussion, the Indian resistance at WTO of not letting the discussion on digital trade will weaken.
- India floated the e-commerce policy draft, but it will not help India bring in changes if e-commerce multilateral agreement (part of RCEP negotiations) is signed.

Many of these RCEP countries are also resisting India's offer on export of services. They want India to accept provisions on domestic

regulations in services. The free movement of investments will benefit investors in the US, Singapore, Japan and China, but very few Indians will be taking advantage of this. India made a suggestion to offer 74 per cent of the goods at zero tariff to RCEP members. However, China, New Zealand, Australia, Japan and South Korea along with some ASEAN countries are pushing India to improve this offer. If India agrees on zero tariff on steel import, it will open flood gates of Chinese imports into India. The entire steel industry of India is lobbying to plug holes in the Free Trade Agreements (FTAs) with Korea and Japan, which hurts their balance sheets. They say that these agreements were envisaged to promote trade between the two countries, but trade remained largely one sided.

The current government's agenda is to develop India into a manufacturing hub, to not only boost the economy, but also create jobs. The present structure of RCEP puts agriculture, horticulture, dairy and food processing in a vulnerable situation, especially from imports from New Zealand and Australia. India is also worried that the RCEP will open backdoor negotiations and may lead to the country losing out on Trade Related Aspects of Intellectual Property Rights (TRIPS) agreements. This may result in giving way to global majors in agriculture seed and pharmaceutical manufacturing. India has the world's biggest generic drug manufacturing capacity. Here, India is getting support of several ASEAN countries.⁸⁵

Naturally India's industrialists are up in arms. Vinod Sharma, MD of Deki Electronics, which imports raw material from China said, "RCEP is nothing but a bilateral trade pact with China. India will lose, China will gain. Once the pact is enforced, India will give more market access to China and our trade deficit will increase further."

Advantages

Economist Ram Upendra Das of the Centre for Regional Trade gives five reasons why India should go ahead with the trade deal:-

- RCEP will be in continuation with India's Look East Policy and the subsequent Act East Policy. It will help tap a large geographical area in South East Asia and beyond and not make our policy only Europe or North America centric.
- Having a higher import number is not wrong. When you don't have something at a suitable price and quality, you source it from somewhere else.
- A sensible economic logic ultimately prevails over protectionism. The US-China trade tension has abated because of this.
- There will always be a sense of anxiety and fear among industry. But industry had adjusted well even when we had opened up our market in 1991.
- If exports increase after RCEP, it will be because of new economic activities triggered by new market access. It will mean additional demand for jobs.⁸⁶

RCEP could be a turning point in heralding major trade related reforms unheard of since the days of liberalization in 1991. Experts say RCEP will give Indian exporters a window to be a part of global value chains. India can't stand alone. It has to be a part of the group.

India's industry, rather than being globally competitive, always runs to the government for protection by use of tariffs. Indian industry

has no option but to rise to the competition. After RCEP, the nature of Indian businesses will change from family run ones to more of joint ventures,” says an RCEP negotiator on condition of anonymity. India’s entry into such a giant club of economies will strengthen its strategic muscle.

This is a chance to bring in historic trade reforms, which in itself will cement India’s position as a major global economy. Will the signing of the RCEP sound the death knell for many in India Inc.? There will be clear answers only after the deal takes a more definite shape. Before that happens, India will have to get through a few hard bouts of negotiations.

Chapter - 7: Conclusion

Graham Allison's famous "Thucydides Trap" warnings are ominous: "Based on the current trajectory, war between the United States and China in the decades ahead is not just possible, but more likely than recognized at the moment."

Dr. John J. Mearsheimer in his book, 'The Tragedy of the Great Power Politics', strongly argues that China's rise is unlikely to be tranquil. His argument is that if China continues to grow economically, it will attempt to dominate Asia the way the United States dominates the Western Hemisphere. The United States, however, will go to enormous lengths to prevent China from achieving regional hegemony. Most of Beijing's neighbors, including India, Japan, Singapore, South Korea, Russia and Vietnam, will join with the United States to contain Chinese power. The result will be an intense security competition with considerable potential for war.⁸⁷

David Kang and Xinru Ma have argued that non-western countries often take a different approach to power transitions. East Asian countries' power dynamic is different. Kang found that "only three out of eighteen dynastic transitions that occurred prior to the nineteenth century came as a result of external war." Rather than a focus on becoming the most powerful as Western states do, East Asian history points at a desire to maintain power.

According to Michael Beckley, China's rise is overhyped since it is based on gross indicators such as GDP that ignore many of the domestic costs that come with governing a massive population. Chinese aggregate power may be great, but its ability to project power is limited. Even if China builds up its military, America will continue to benefit from a significant lead in capabilities.

As per Jack Levy and William Thompson land powers generally don't form rising coalitions against sea powers because it is generally more militarily costly to do so and the benefits of bandwagoning are greater. America, a leading maritime power, is interested in expansion of markets, not territory. China is more likely to continue to focus its energy on regional threats rather than hastening a global shift in power.

Power struggle is inevitable. With growing economies and expanding states, the exact future of the East Asian balance remains unclear. The question that stands is whether this rise of power will cause great conflict and result in war. The present balance of power favors the United States and should for some time. There is only a small chance of a great war on the near horizon.⁸⁸

China expects to be technologically at par with the most advanced countries by 2030. This will depend on the policies focused on:-

- Effective competition, composition of the business sector and its strategic orientation.
- Agile policy making and robust regulation which minimizes the risk of crises.
- Skill development.
- R&D.

- National and international networking to promote innovation.
- Nurturing of innovation especially in the areas of green technologies, health and medical services, urbanization modes and in major urban centers.

The path of China's rise in technological capability is drastically different not only from the Soviet Union model, but also the newly industrialized Asian economies. It is driven by a mix of the strong will of the state, which supplies both guidance and policies, resources and economic forces. China has now mature capabilities in medium level technology, such as machinery, infrastructure construction, modern logistics, electronics and renewable energy equipment. These technologies are exactly what the developing world needs to quickly improve economic and social wellbeing.

As China keeps moving from medium technological capability to high tech capability, many of today's high tech industries will become commoditized at an accelerated speed. In the past 10 years, China has commoditized computers, smart phones, modern metro subways and even high speed rail. In the future, some of the technologies enjoyed today by advanced countries — such as smart and clean energy systems, autonomous driving cars, new energy vehicles, automation and robotics, advanced medical equipment and medicines etc. will become increasingly more affordable to developing countries, a process that will be largely driven by China. This development will benefit low income countries.

However, this does not mean that China will become a global leader in technology and innovation, so that it can replace today's advanced economies. China's achievements in the recent decade

are mostly limited to “catching up” in targeted fields. Most of the original innovations that Chinese industries are currently capable of are “incremental” rather than “disruptive” breakthroughs. There is a long way to go for China to transform from a fast learner to a true innovator in major high tech fields. China certainly will be one of the world’s greatest powers, with an outsize influence in shaping the 21st century. But whether it overtakes the US as a superpower remains in question.⁸⁹

China’s emergence as a second powerful country is providing an alternate view to many of US’ unilateral actions. Some of them are:-

- China does not subscribe to the liberal norms of the countries that established the world’s international institutions. China seeks to inject their own values into them. In the 1990s, when the United States used military force in Panama, Haiti and the Balkans, China’s concern with its own territorial disputes bolstered its opposition to intervention by Western powers. In 1999, the United States intervened in the Balkans again but this time bypassed the UN Security Council, where China could have wielded its veto.
- China has joined and become an increasingly active member of existing groups and pacts. But it has also tried to diversify the system by supporting competitors to them. China has endorsed parallel structures, such as the BRICS group of major emerging economies (Brazil, Russia, India, China and South Africa), which has formed a development bank and a contingency reserve fund. The Asian Infrastructure Investment Bank (AIIB)

is an example of this approach. China did not abandon the old institutions: it remains the third largest funder of the AIIB's closest competitor, the Asian Development Bank and is increasingly active in the World Bank.

- China is the world's second largest economy, largest trader, manufacturer and emitter of carbon. Global economic and environmental problems cannot be solved without its participation.
- China's increased role will naturally reduce the influence of smaller European democracies.

The International Energy Agency, initially a group of the world's major oil consumers, whose membership and the voting shares of whose members have been frozen since the group's founding in 1974. As a result, it does not include China or India, the world's first and third largest energy consumers, respectively. It gives outsize weight to small European states that were major oil importers in the 1970s but no longer are. The result is a less functional institution on issues such as the coordination of stockpiles and technical standards.

China often succeeds at its efforts to reform global institutions and build pan Asian groups because its demands mesh with those of India. India helped found the AIIB and now ranks as its second largest shareholder. Despite their suspicion of Chinese power, there is a feeling in India that new forums act as a needed counterweight to unrepresentative global institutions.

BRI has been portrayed as an attempt to make the rest of the continent dependent on China's economy. But the notion of regional

connection is no Chinese invention. Many countries, including India, Japan, Singapore, South Korea and even the United States have helped build or finance such links across Asia. For example, it is Japan, not China, that is financing the Delhi Metro and the Delhi–Mumbai Industrial Corridor, a \$90 billion high tech industrial zone and freight route connecting India’s political and economic capitals.

Chinese people are driving China’s economy. In many consumer categories, China is the largest market in the world. Today, China accounts for 30 percent of global auto sales, 43 percent of unit sales of electric vehicles and 42 percent of global retail e-commerce transaction values. US economic players already rely on the China market. According to consensus forecasts, Chinese consumption is expected to grow by about \$6 trillion from today through 2030. This enormous sum is equivalent to the combined consumption growth expected in the US and Western Europe over the same period, double that of India and ASEAN economies together.

Despite the doom and gloom China continues to rack up one of the most enviable growth rates in the world, adding the equivalent of “another Australia” each year. China is willing to use the existing international order to continue assuming a bigger role on the multilateral stage. China stepped up its overseas presence by increasing its outbound investment. One of its key policies is to increase its footprint in developed economies, where it can acquire technologies, brands, and management skills, as well as access to major markets including the eurozone.

Beijing’s narrative has had an impact on a number of governments around the world—a majority of them classifiable as ‘illiberal’, for

example: Egypt, Ethiopia, Pakistan, the Philippines, Sudan and Turkey. China has growing influence in European countries, such as Cyprus, the Czech Republic, Greece, Hungary, Macedonia, Montenegro, Poland, Portugal and Serbia.⁹⁰

Imperatives for India

India has to do some very tight rope walking. The weakness of Indian economy specially in manufacturing sector which provides job stands exposed. India manufacturing industry has no option but to be globally competitive to survive in today's globalized world.

India-China relationship is riddled with deep strategic mistrust. India has fought a war with China. The land boundary dispute between the two countries remains unresolved. China has constructed roads in Fukche, Demchok and Doklam to create tension between the two countries. Chinese capacity build-up and construction activity, not just along the Line of Actual Control (LAC) but also in sensitive regions such as the Doklam Plateau continue despite the tense 2017 standoff and Xi-Modi informal summit at Wuhan. China has been using Pakistan to contain India effectively. China's engagement in Pakistan via CPEC is a reminder of Beijing's disregard for India's concerns regarding the violation of its sovereignty and territorial integrity. China's deep military ties with Pakistan along with the diplomatic cover it provides for Pakistan based terrorists are testimonies of China's intentions.⁹¹

Despite the border tensions India has to engage China economically to reduce the trade deficit between the two countries, take advantage of the ongoing US China trade war, get FDI from China, collaborate in emerging technologies to take Indian economy forward.

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VIVEKANANDA INTERNATIONAL FOUNDATION

3, San Martin Marg, Chanakyapuri, New Delhi – 110021

Phone: +91-11-24121764, 24106698

Email: info@vifindia.org, Website: <http://www.vifindia.org>

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