CHINA

Systemic Rival, Economic Competitor and Negotiating Partner?

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Preface by Admiral M. Hofman, Chief of Defence

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Responsible publisher: Filip Borremans
Editor: Luk Sanders
Design: Royal Higher Institute for Defence
Featured image: © Pixabay
ISSN: 2295-0923

January 2021
Second (revised) edition
First published in October 2020
Brussels

Table of Contents

Abbreviations and Vocabulary

CMI: Civil-Military Integration

CPC: Communist Party of China

Mainland China: The area under the direct jurisdiction of the PRC, including Hainan Island and excluding the special administrative regions of Hong Kong and Macau.

MIC25: Made in China 2025

PLA: The People's Liberation Army (i.e. the PRC armed forces)

PRC or just **China:** The People's Republic of China

The Republic of China: Taiwan

Preface

Dear reader,

In 2019, the Belgian Defence Department presented the Security Environment Review, an analysis of the security trends that the contemporary world is facing, with particular emphasis on the economic players. Several of these trends, such as the data explosion, more economic stress and political fragmentation, have been confirmed and the Covid-crisis we are currently going through is undeniably playing a catalytic role.

One of these trends, the *power shift*, had raised many questions amongst you. Indeed, who says *power shift* says positioning of China and positioning towards China. What attitude should we adopt with respect to this economic adversary with considerable growth objectives and ever-increasing leadership aspirations? How should we deal with a trading partner that is continuously challenging our key values and core political and security interests?

This publication will provide some answers to your questions and I am confident that the seminar organised on the occasion of its publication will enrich our mutual understanding of the *power shift* trend.

The purpose of the Defence Department is to guarantee the security of our citizens, upholding our country's freedom of action, securing vital infrastructure, and preserving strength relative to actors that challenge our values and interests. The provided objective and realistic analyses on global security issues will contribute to this purpose. Well-developed knowledge and thorough understanding of the security environment is indeed an essential premise for strategic decision-making. It is the intent of the Belgian Defence Department to ensure that its expertise regarding the security environment will benefit a wider public in the future. To this end, it will rely on the network and expertise of the Royal Higher Institute for Defence. Moreover, I can already announce that we will present you an updated Security Environment Review in 2021.

Finally, I would like to reiterate my sincere thanks to all those who have contributed to this project. The experts from the Université catholique de Louvain, the Vrije Universiteit Brussel, the Royal Military Academy, the Royal Higher Institute for Defence and the China specialists from the Belgian Defence Staff have combined their strengths and skills to provide answers to our questions about the Middle Kingdom.

I wish you a lot of pleasure in reading '*China. Systemic rival, economic competitor and negotiating partner?*'

Michel Hofman
Admiral
Aide-de-Camp to the King
Chief of Defence

Introduction

Luk SANDERS

Among Western philosophers, every now and then, the question is raised whether there is such a thing as *Chinese philosophy*.[1] No one is questioning the intellectual merits of Sun Tzu, Confucius, Lao-Tze, and other great Chinese thinkers, yet the idea is that their premises, languages, ideas, and essentially their ways of thinking are so fundamentally different from ours that it is disputable to put the same label *philosophy* on both ways of thinking.

Although there is such a thing as Chinese politics, economy, defence doctrines, etcetera, there too, the ways of thinking are so different that in the last decade, with increasing interactions between China and the West, all kinds of confusions of tongues and unpleasant surprises occurred.

Because of shared values, democratic countries interact more easily with one another than with autocracies. Democracy is more than just a political regime; it is a way of life, a key ingredient of Western civilisation. However, in *The Economist Intelligence Unit democracy index's* latest edition, China is labelled an autocracy and is ranked at a poor 153rd position, just between Eritrea and Burundi (cf. infra).[2]

Therefore, we, as Europeans, interact easier with more likeminded partners, such as Americans, for instance. Our histories, political systems, legislations, languages, and even our blood are all so related that over time, Europeans and Americans reached a wide variety of (mostly unconscious) consensuses on the principle of *self-interest rightly understood*.

Geopolitics, international trade and defence policies are not based on altruism, charity or genuine friendship; however, Europeans and Americans know how to deal with one another because of a certain degree of justified mutual trust that has been forged over decades, if not centuries. Not every government, company or individual always respect the rules of the game, but at least the rules are transparent and there is a relative consensus on how to deal with cheaters. Not every deal is a win-win situation, but at least that has become the standard somehow. All armed forces defend the interests of their homeland, but the overlapping interests are so vast that close collaboration has become obvious on both sides of the North Atlantic.

[1] (Cheng, 2006).
[2] (The Economist Intelligence Unit Ltd 2020, p. 14).

The same kind of justified mutual trust does not exist between Europe and China. Nevertheless, the economic opportunities the country offers are hard to ignore. In the last fifteen years, the greatest creation of national wealth in human history took place in China and it is already EU's second largest trading partner, with trade in goods worth well over 1.7 billion euros a day (in 2018).[3] Therefore, whether we like it or not, China already is an important partner of the EU, even though its business environment is relatively new, rarely transparent, and not embedded in a long tradition of modern trade with the West. In addition, the country is afflicted by corruption. Occasionally this leads to *self-interest wrongly understood*, i.e. doing business in a way it harms mutual trust and serves no one's interest on the long run, at least not on a macro scale.

So on the one hand Europeans and Americans have been trading successfully with one another for many decades (based on shared values and justified mutual trust), and, on the other hand, nowadays the lesser-known China seems to offer higher business opportunities. From that perspective, today one could say that doing business with the US starts to look like a rather conservative investment, while doing business with China is a much wilder bet. Ursula von der Leyen, President of the European Commission, certainly had a point, when she said:

> "China is, simultaneously, in different policy areas, a cooperation partner with whom the EU has closely aligned objectives, *a negotiating partner* with whom the EU needs to find a balance of interests, *an economic competitor* in the pursuit of technological leadership, and *a systemic rival* promoting alternative models of governance. This requires a flexible and pragmatic whole-of-EU approach enabling a principled defence of interests and values."[4]

Actually, it must be possible to reach at least some higher level of self-interest rightly understood between China and the West, albeit on an intelligently calculated contractual basis rather than based on shared values and mutual trust. This however will need time and reflection.

Time, we cannot offer you some. However, we can offer you reflection. Therefore, some Belgian researchers from different backgrounds, yet all with a special interest in China, joined forces to write the text laying in front of you.

In *the first chapter*, some considerations will be made on China as an autocratic welfare state. In spite of a lack of political, economic and social freedom, a large majority of Chinese citizens seem to be highly satisfied with the way their country is run. The main focus of this chapter is a search for an answer to the question how that is possible, with a general presentation of today's Chinese

[3] According to the *EU China Relations Factsheet* of the EEAS, in 2018, EU exported 210 billion euros to China while China exported 395 billion euros to the EU. However, with respect to services the trade balance is in favor of the EU that exported in the same year 51 billion euros to China and imported 30 billion euros from China (EEAS, 2018).
[4] (HR of the EU for Foreign Affairs and Security Policy 2019, p. 1). The italics are mine.

society as an underlying focus. The findings will lead to the question how sustainable this strange kind of happiness is. At the end, some medium term prognoses will be made about this autocratic welfare state.

The second chapter focuses the question of economic and national security on the issue of Sino-Belgian research collaboration. After an overview of Sino-Belgian R&D partnerships, their consequences will be discussed from a security perspective.

The third chapter deals with China's cyber strategy, including an analysis of the vulnerability of our infrastructures, the dangers of information warfare, and the question of cyber sovereignty. After an overview of new technologies and raw materials, eventually a series of recommendations will be offered in order to develop a better resilience in relation to the Chinese cyber issue.

In *the fourth chapter*, key trends and developments in the late evolution of China's defence industrial and technological base will be examined, including the strategic guidelines and framing principles behind it. It is organised according to three sets of concerns. First, the domestic outlook for the transformation of China's defence-industrial complex, thereafter China's arms exports, and finally China's defence innovation trajectory in support of Beijing's strategic plans and imperatives, with a particular attention for artificial intelligence.

The fifth and final chapter makes the case for small European countries to rise to the China challenge and to ready for a measured, yet comprehensive balancing effort. The aim is to set the scene for a broader strategic debate, and also to seize China's ascent to come to grips with some thorny issues inside our own country and armed forces. After explaining the potential, the desire, the opportunities, the reach and the vision of China as a rising power, eleven recommendations are made on how small European countries are capable to balance the rise of China as a global superpower.

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Land of Strange Happiness

An Assessment of China as an Autocratic Welfare State

Luk SANDERS

Introduction

The focus of this chapter is a general presentation of social life in modern China as an autocratic welfare state. Even though the country is in no way a democracy, today, a large majority of Chinese citizens seem to be enthusiastic about the way their country is run. Therefore, I will search, more in particular, for an answer to the following question: *how is it possible that in an unfree society, citizens have a high esteem of the government's functioning?*

First, it will be explained what is meant by an *autocratic welfare state* and how China succeeded in building it. Second, the search for an answer to the central question will start with the help of a series of strange survey results in the fields of economy, politics and social life of some high standard international research centres. Then, after some final considerations, a conclusion will follow.

Even though this chapter will mainly focus on life within China, I hope this theme can also give a better insight in the way the CPC and the Chinese people think as a trading partner, as a new assertive player on the international scene, and as a rival of liberal democracy.

China's Path through to the Autocratic Welfare State

Throughout the nineteenth and twentieth century, one could reasonably think that a *prosperous welfare state* was to some extent also a *democratic state*. However, in the 1990s, several not so democratic economies started to grow considerably, like Russia, as well as some South American and sub-Saharan countries. Yet back then, these regimes not only pretended to be democratic; their political and economic reforms also went towards more freedom and socially corrected capitalism, although often tentatively and not necessarily with the intention of ever becoming an actual democracy.

The first remarkable exceptions to the rule that prosperous welfare states tend to be democratic were probably the UAE and Qatar. In addition, during the Arab Spring, even more rich oil states bought social peace by massive investment in

housing and other benefits for the poor… Yet in the meantime, China already caught the Arabs up.

The opening ceremony of the 2008 Olympics in Beijing was for China a pinnacle of national pride. After a century and a half of shame and humiliation, backward economy and harsh poverty, famines, Japanese invasions, and relative geopolitical insignificance in spite of having the world's largest national consumer market, that very year, the country presented itself to the world as a prosperous superpower. However, in those days, when the West preached about human rights, one-child policy, or political freedoms, Chinese kept their profile low, because they depended on the West and, from an economic point of view, somehow they still felt inferior… until the collapse of Lehman Brothers investment bank, provoking the most severe international economic crisis since the Great Depression. China, however, kept on booming. In 2009, Poland was the only Western country that did not fall into a recession. At the same time, China was the only economy in the entire world with a GDP growth rate of over ten percent. It appears that, as a result, the CPC concluded it had no longer lessons to learn from the West, neither in economy, nor in politics.

China dropped its traditional low profile attitude on the international scene and started to spread its social, economic and political model: the *China Model*. Many African leaders that conducted some significant democratic reforms in the 1990s all of a sudden concluded that democracy was not the ultimate key to national prosperity after all. On the contrary, doing business with countries like Russia, Turkey or China brought quick money to the country, even without being bothered by preaches about human rights, but neither by the real cost of their loans and contracts in the long run. Even some EU member states – Greece[1] and G7 member Italy in particular, often blaming Europe (sometimes for their own mismanagement) – made their economy so dependent on China that it caused a reluctant attitude on their behalf with respect to EU initiatives to tackle China's unlevelled playing field in trade.

Today, China is the most prominent example of the relatively new phenomenon of the *autocratic welfare state*. In the latest edition of the prestigious *The Economist Intelligence Unit democracy index*, the country is labelled an *autocracy* and is ranked at a poor 153rd position, just between Eritrea and Burundi. According to the World Bank, Burundi has the worst GDP (PPP) per capita in the world (at least of all 187 countries for which relevant data is available), with an average of only 782 USD per citizen per year. Eritrea is not doing much better. China however does, with 16,785 USD and a 78th position. The two Special Administrative Regions of the PRC are ranked separately and are even doing way much better, with Hong Kong at the tenth position with 62,375 USD and Macau at the very first position with a GDP (PPP) per capita of not less than 129,103 USD.[2]

[1] (Horowitz & Alderman, 2017).
[2] (The World Bank, 2020).

Nonetheless, some thirty years ago, China still was a third world country under totalitarian rule. Its economy started then to grow and even, ten years later, to boom. In 1998, China's GDP exceeded for the first time one trillion USD (1.03 trillion). Twenty years later, in 2018, that GDP reached 13.61 trillion USD[3]… a growth rate of 1,221% in one generation. In the same period, America's GDP went up from 9.06 to 20.49 trillion USD, i.e. a growth rate of only 126%, almost ten times less.

According to the World Bank, China's poverty rate fell from 88% in 1981 to 0.7% in 2015, meaning that more than 850 million Chinese people have been lifted out of extreme poverty (i.e. living on the equivalent of 1.90 USD or less per day in 2011 purchasing price parity terms).[4] There is no doubt that the highest priority of the CPC remains the continuation of its own rule, but it seems that the party has discovered that people cannot only be controlled by sticks but also by carrots.

With respect to the UN Human Development Index, China skyrocketed as well. In 1990, it had a score of 0.502. That is where today countries like Afghanistan (0.496), Haiti (0.503), and Sudan (0.507) lag behind. Meanwhile it raised up until 0.758, today comparable to countries like Peru (0.759) and Azerbaijan (0.754), or like Belgium in the late 1980s.

Even more impressive is the (r)evolution in education. In 1982, more than one third of the Chinese were illiterate. Today 40% of males and 45% of females even graduate college. According to the latest PISA survey (2018), it turned out that 15-year old Chinese children (both boys and girls) outperformed their peers in all of the other 78 participating countries in mathematics and science by a wide margin, and in reading, only Singapore came close.[5] The 10% most disadvantaged students in China showed better reading skills than those of the average student in OECD countries, and performed on a par with the 10% most advantaged students in some of them. What makes their achievement even more remarkable is that the level of income in the Chinese regions that have been tested[6] is well below the OECD average.[7] In addition, today, not less than eight Chinese universities figure in the top 50 of the world's best universities (four from mainland China and four from Hong Kong).[8]

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[3] https://data.worldbank.org/country/china?view=chart.
[4] https://data.worldbank.org/indicator/SI.POV.DDAY?locations=CN.
[5] (Schleicher, 2019).
[6] Given the vast population of China, PISA decided to assess only four large regions in China. On top of that, Hong Kong and Macau participated separately, with excellent results as well.
[7] At the same time, they seem to have a long way to go when it comes to improving the social and emotional outcomes, and other aspects of students' well-being that were measured by PISA 2018.
[8] https://www.topuniversities.com/university-rankings/world-university-rankings/2021.

The Chinese government constantly tries to improve itself in many fields concerning well-being. Every year, the state-run media outlet *People's Daily* asks the Chinese people to weigh which social, political, and economic issues matter most to them, with many millions of respondents.[9] China's public spending on education, health care, and pensions has increased from 6.3% of GDP in 2007 to 11.6% of GDP in 2016[10], growing even faster than spending on military or domestic security programs. However, according to the annual People's Daily surveys, *social security* still seems to be a major citizen's concern. The Chinese people is aging rapidly, due to a combination of the aftermath of the one-child policy and an impressive increase of life expectancy. Therefore, the government is struggling with the affordability of pensions.[11] This however is not different in many democratic welfare states. On the other hand, with respect to health care, so far China still did not come close to the high quality level of most West-European countries. As a result, in 2016 Xi Jinping rolled out his *Healthy China 2030* program, with targets for ambitious improvements.

Therefore, China's attempts to improve the living conditions of its citizens have been successful so far, but let there be no mistake; China cannot be considered in anyway as a democracy. It is an autocratic welfare state.

The greatest happiness for the greatest number?

Some early modern, utilitarian, Anglo-Saxon philosophers[12], who were standing at the cradle of democracy, shared the following leitmotif: *the greatest happiness for the greatest number* (of the people). Knowing that, the results of an Ipsos survey on *What Worries the World*, published in 2019, are most remarkable. In this survey, over 1,000 Chinese citizens, aged between 16 and 64 (just like citizens of 27 other countries) were asked: "*Is your country on the right track?*" It turns out that 94% of Chinese respondents gave an affirmative answer.[13] This is even higher than in all previous years.[14] Without any explanation, in the latest Ipsos survey, China was the only country that was excluded from the usual list of assessed countries (just like in all Ipsos' other surveys concerning *What Worries the World*), probably because of the early Covid-19 outbreak.

[9] Classic examples are *fighting corruption, alleviating poverty, international relations, the housing system, a strong military, technological innovation, cultural confidence, educational reform, the rule of law, social security, environment*, and many more.
[10] (Rothschild, 2019).
[11] (Wang & Cai, 2019).
[12] The most prominent spokespersons were Francis Hutcheson (1694-1746), Joseph Priestley (1733-1804), and Jeremy Bentham (1748-1832).
[13] (Atkinson, Skinner, & Gebrekal, July 2019, p. 4).
[14] Ipsos started its *What Worries the World*-surveys in 2016, with the following results for China about "*Is your country on the right track?*": 89% in 2016, 87% in 2017 and 92% in 2018.

World average: 42%	Poland: 42%	Sweden: 33%
China: 94%	South Korea: 42%	Turkey: 33%
Saudi Arabia: 78%	US: 42%	Germany: 32%
India: 73%	Canada: 41%	Hungary: 31%
Malaysia: 60%	Italy: 41%	Spain: 27%
Australia: 50%	Russia: 41%	Belgium: 26%
Serbia: 49%	Chile: 37%	South Africa: 26%
Mexico: 46%	Japan: 37%	France: 23%
Brazil: 45%	Argentina: 36%	Great Britain: 22%
Israel: 42%	Peru: 35%	

Fig. 1: Is your country on the right track? Percentage of respondents saying *'yes'*.

The Ipsos Group is a credible international market research company and, even with an error margin of 15%, China still would be the number one in the survey among 28 participating countries. Therefore, the number is vast enough to conclude that the CPC does some serious thinking on the concept of *the greatest happiness for the greatest number*.

In order to understand these results, even if we have some reservations, some geographical and demographic elements already might help a little.

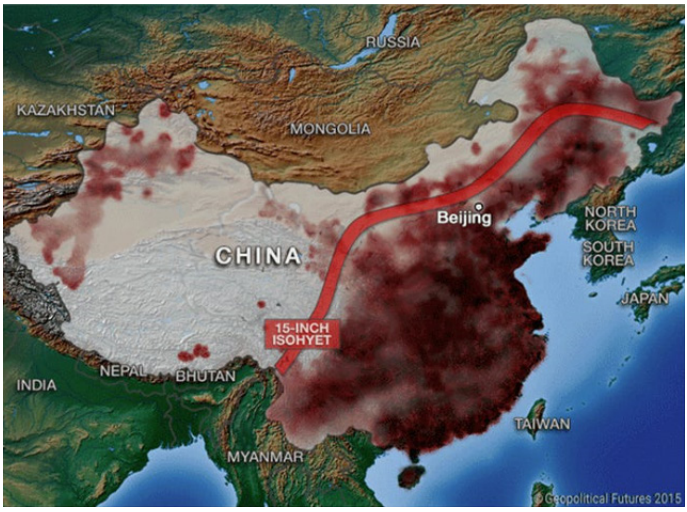


Fig. 2: 15-inch Isohyet and China Population Density.

Geographically speaking, the economic miracle of the PRC only concerns a small part of the country, yet a rather large part of its population. Roughly, 15 inches of annual rainfall is needed to maintain an agricultural economy.

This line, called the 15-inch isohyet, is shown on figure 2, along with areas of population density.[15]

The fertile area included in the 15-inch isohyet is Han China plus, in the east, parts of Manchuria. The areas to the west and north are very lightly populated, namely Tibet in the southwest, Xinjiang in the northwest, Inner Mongolia in the north, and Manchuria in the east. Whereas Inner Mongolia seems to be nearly non-existent for the outside world, Tibet and the predominantly Muslim province Xinjiang are often in the news when it comes to human rights violations, but the Uyghurs (roughly 12 million people) and the Tibetans (about 3 million) combined constitute only little more than one percent of China's population. Therefore, the deplorable situation of those people has hardly any impact on the Ipsos survey.

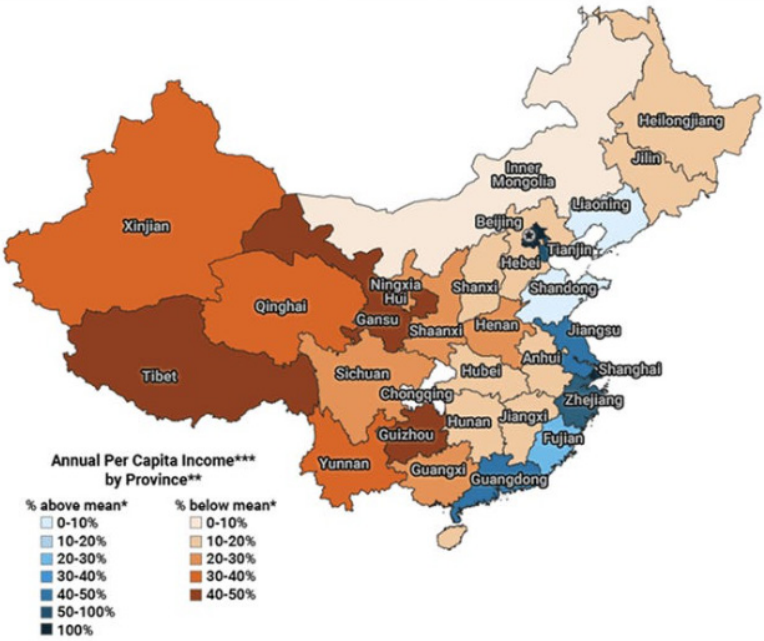


Fig. 3: Income by Province.

According to the latest edition of the CIA's World Factbook, the Chinese Government officially recognises 56 ethnic groups. However, 91.6% of all PRC's population are Han Chinese[16], being the world's largest ethnic group.[17] This not only gives them strength by number, it is also part of the CPC's policy to discourage certain languages, religious practices, and other traditions of many

[15] The maps in figure 2 and 3 stem from (Friedman, 2017).
[16] (Central Intelligence Agency, 2019).
[17] Obviously, many Han Chinese also live outside Han China; not only within the PRC, but also outside. They constitute for instance also 97% of Taiwan's population and 75% of Singapore's.

non-Han ethnic groups in China.[18] In a way, Tibet, Xinjiang, Inner Mongolia, and to a lesser extent Manchuria, can be considered as buffer states, an excellent geographical protection of the core of the PRC, being Han China.

In any case, the rainfall line roughly defines the limits of what we think of today as the economic miracle of the PRC. By the way, figure 3, presenting the income per province, illustrates a striking economic difference between Han China and the rest of the country. In the western buffers, the income per capita is between 30 and 50 percent lower than the median income in the rest of China. The interior of Han China is not as bad off as the buffers, but only the coastal area is above the median, some provinces over 100%. Every other area is below it and therefore, the overwhelming part of Chinese wealth is concentrated in a strip of only 300 kilometres along the coastline.

Even though these geographic and demographic elements already might have given some first elements of clarifications, essentially our main question remains *"How is it possible that in an unfree society, citizens have such a high esteem of the government's functioning?"* As earlier mentioned, in the coming paragraphs, the answer to this question will be split up in an economic, a political and a social part.

Economic Freedom?

According to the latest Heritage Foundation report on *Economic Freedom*, China has an overall poor score of 59.5 (yet 1.1 better than last year), ranking the country at a 103th position out of 180 and labelling it as *mostly unfree*.[19] At first sight, this result is more helpful to explain the Hong Kong protests (Hong Kong being the second in the ranking, last year even the best with a score of 90.2) than to explain the high citizen's satisfaction concerning CPC governance.

Moreover, China's economy is afflicted by high corruption.[20] It harms the CPC's reputation, adds to economic inequality, and fuels social unrest, but in spite of all Xi Jinping's firm announcements to beat corruption, according to the *Corruption Perceptions Index* (CPI)[21], his net result so far is zero. In 2012, when

[18] (Kotkin, 2011).
[19] (Miller, Kim, & Roberts, 2020 Index of Economic Freedom, 2020) and (Miller, Kim, & Roberts, 2019 Index of Economic Freedom, 2019).
[20] In China, Black Mafia is distinguished from Red Mafia, the former being street gangsters providing protection and quasi law enforcement, the latter being public officials selling public appointments, exchanging illegal benefits with businesses and protecting local gangs (Wang P. , 2017).
[21] The CPI is an index published annually by *Transparency International*, which ranks countries by their perceived levels of public sector corruption, as determined by institutions such as the World Bank, the World Economic Forum, the German *Bertelsmann Foundation*, the American *Freedom House,* the British Economist Intelligence Unit, etc.

Xi Jinping became the CPC's general secretary, the overall CPI score was 39, just like in the latest edition. Actually, China's CPI score is even significantly worse than many other countries with a reputation of being highly corrupt, such as Saudi Arabia, Cuba, and Ghana. Most probably, the CPC does some efforts to beat corruption, but at the same time, it is one of its classic tricks to turn a half-blind eye to the monkey business of party officials and executives. By doing so, the party is able to blackmail them, as soon as their loyalty towards the CPC seems to decrease or at any moment, when a scapegoat is needed to publicly take responsibility for another CPC blunder.

Nonetheless, there are at least two reasons why most Chinese do not bother a lot about state corruption and the lack of economic freedom. First, the difference with the past is beyond imagination. In spite of the relative lack of economic freedom at a global scale, it is an understatement that the economic freedom the Chinese are experiencing today is unprecedented and the perspectives today's youngsters have for their future are sky-high compared to the ones their parents and grandparents used to have. This completely new reality is the result of the CPC's deliberate policy of economic reforms. Therefore, it is not surprising that many Chinese citizens think their "*country is on the right track*". Second, inside China, many aspects of state corruption and the lack of economic freedom are widely considered as powerful tricks to outsmart the West. Numerous Chinese businesspersons laugh up their sleeve because they believe the CPC is so much smarter than Washington D.C. and Brussels combined, through measures commonly referred to in the West as the *unlevelled playing field*.

In an interview with *The China Macro Reporter*, Joerg Wuttke, president of the EU Chamber of Commerce in China, said: *"We estimate that we lose about 30 billion euros every year because of companies not being able to operate in China the way Chinese companies are able to operate in the EU."*[22] Just take the example of Fujian Grand Chips, a purportedly private Chinese company that attempted to acquire German machine maker *Aixtron* in 2016…

> "Shortly before it staged a public takeover of *Aixtron*, another Fujian-based company San'an Optoelectronics cancelled a critical order from *Aixtron* on dubious grounds, sending its stock tumbling and presenting Fujian Grand Chips with an opportunity to swoop in. Both Fujian Grand Chip and San'an Optoelectronics shared a common investor: an important national semiconductor fund controlled by Beijing. The acquisition was stymied by an 11th-hour intervention by government officials but demonstrated how Beijing can drive investing abroad, often in a highly coordinated manner."[23]

[22] This interview was found on https://www.chinadebate.com/china-macro-reporter-interview/joerg-wuttke-may20. For an unknown reason, the interview recently seems to have been removed from the internet.
[23] (Laskai, 2018).

It looks like the CPC manipulated the market by pushing San'an Optoelectronics (probably with subsidies) to cancel a critical order from *Aixtron* in order to enable Fujian Grand Chips to buy the German machine maker at an artificially low price. There is no smoking gun, but the coincidence is striking, similar coincidences are numerous, and they nearly always go in the same direction. In China, government intervention still goes much further than what is conceivable today in any Western capitalist state, in a way that it occasionally violates WTO rules.[24] The *Aixtron* case is just another Chinese assault on the free market as well as a case of blatant corruption… but the Chinese benefit from it.

Political Freedom?

Although most Chinese citizens enjoy nowadays various kinds of unprecedented freedom, they do not include *political* freedom in any way. The latest Freedom House Report on *Freedom in the World* presented a ranking about *political rights and civil liberties* of all 183 countries in the world with one million inhabitants or more. In that report, China ended at a painful 168th position, leaving behind only a handful of countries like (South) Sudan, Turkmenistan, Eritrea, Libya, North Korea, and Syria.[25]

In Xi Jinping's China, youngsters keep on discovering formerly unknown forms of freedom and enjoy a wealth that was unheard of by their grandparents, but at the same time the lack of political freedom is worse than some ten or twenty years ago.

Yet there too (albeit to a lesser extent than with respect to economy), many Chinese are convinced this is a secret weapon to outsmart the West. The buzzword is *unity*, an age-old obsession in Chinese culture, older than communism, capitalism and modern democracy. This concept might sound beautiful, yet it is one of the most common traps for politicians throughout human history. As a matter of fact, for more than two centuries, democracy thrived to a large extent on *division* of power: separation of state powers, separation of church and state, politics organising its own opposition (for instance, by free press, freedom of speech, rights of unions and minority parties)… Maybe this divergent vision on unity and division is the most profound difference between democracy and autocracy.

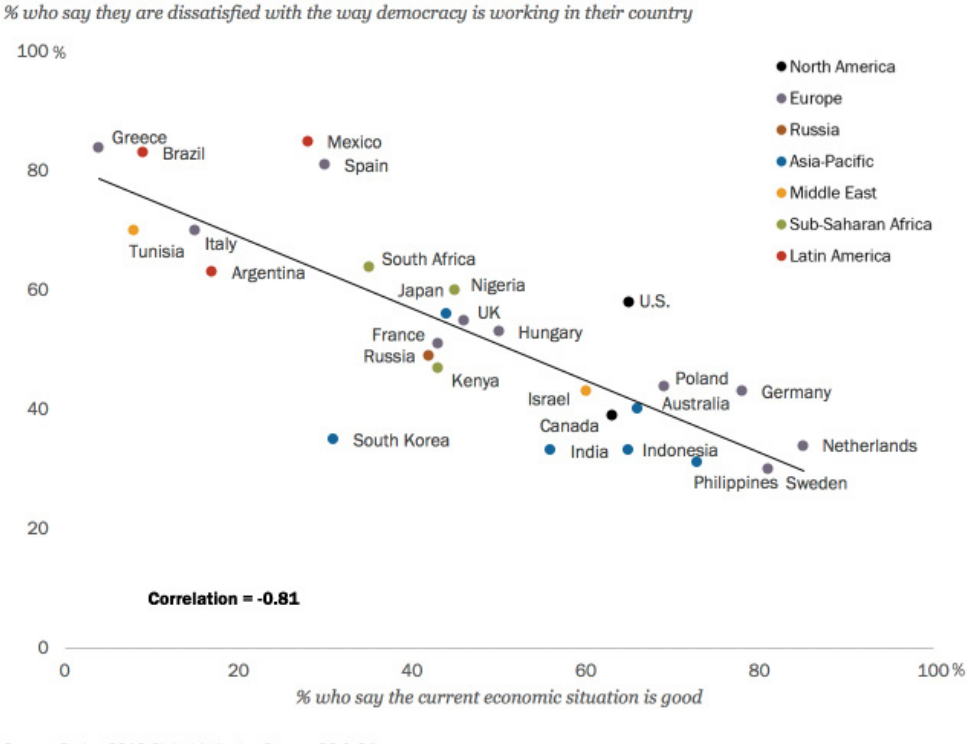
Another reason why so many Chinese can settle in reduced political freedom is that, in a single-party system, long-term planning is much easier than in a

[24] In 2001, China joined the World Trade Organization. Today it is its largest trading power, with a total international trade value of 4.62 trillion USD in 2018. See *Appendix Table 1: Leading merchandise exporters and importers, 2018* in (World Trade Organization, 2019).
[25] (Freedom House, 2019, p. 16).

democracy, where planning can reach hardly any further than the next election. The economic miracle that China experienced would have been impossible with such a short-term planning.

Obviously, a justified fear for repression is also one of the reasons why so few Chinese citizens feel the need to oppose the lack of political freedom in their country, but probably the most important explanation is material prosperity, i.e. the economic boom the country experienced. Here, the carrot is more effective than the stick.

A survey, conducted by the PEW Research Center in 2018 among 28 (rather random) countries (excluding China), showed an astonishing high correlation of 81% between a negative perception of the economy by citizens and a dissatisfaction with how democracy is functioning in their country (even though not all of the countries surveyed are democracies).[26]



Source: Spring 2018 Global Attitudes Survey. Q2 & Q4.

PEW RESEARCH CENTER

Fig. 4: Economic pessimism is linked to dissatisfaction with how democracy is working.

[26] (Wike, Silver, & Castillo, 2019).

It is important to realise this survey is about people's *perception*, about *what people say*. In that respect the difference between for instance Greece and the Philippines is striking. It seems that the Greek assess their economy as very bad and that they are very dissatisfied with the way democracy works in their country. The Filipinos apparently think the exact opposite about their country. However, when we take a *snapshot* of only the situation in 2018, there does not seem to be one objective indicator[27] to justify both people's rather extreme judgements, neither on the economy nor on democracy. Even when we look at the democratic *trend*, it seems that Greece is going up (both in the *democracy index* and in the Freedom House's *political rights and civil liberties*) where Duterte's country is actually in a democratic crisis and goes down. In fact, all indicators show the opposite of what both Greek and Filipinos think, except for one, i.e. *the economic trend* (that is going upward in the Philippines and went down in Greece in previous years). Obviously, the same does not go for all countries, but at least it shows that fast economic changes can have a dramatic impact on the people's perception on the government's functioning. Therefore, is it surprising that in a country with an economic growth of 1,221% in one generation, citizens do not bother very much about a lack of democracy? Is it unthinkable that in a country that witnessed the greatest creation of national wealth in human history, many citizens are ready to sacrifice some *political rights and civil liberties* if that is the price to pay? The probability only increases when we look at the country at the second position in the 2019 Ipsos survey. From that survey, it seems that 78% of Saudis think their country is on the right track, with an increase up to 91% in the 2020 Ipsos' survey, even though the situation of *political rights and civil liberties* in that country is even worse than in China (with only eight countries doing worse).

Obviously, the title of this chapter is somewhat provocative, since most Westerners are aware of the painful situation in which Uyghurs and Tibetans live. The minority that does not conform to the state vision about unity, security, religion, ethics, prosperity, or about the three T's (Tibet, Taiwan and the 1989 Tiananmen Square protests) often undergoes severe persecution. Especially in the Xinjiang province, hundreds of thousands of citizens are locked up in re-education camps, often on a pre-emptive basis, just due to a suspicious profile.

According to the latest *Amnesty International* yearly report:

> "The [Chinese] government continued to draft and enact new laws under the guise of 'national security' that presented serious threats to human rights. Nobel Peace Prize laureate Liu Xiaobo died in custody. Activists and human rights defenders were detained, prosecuted and sentenced

[27] That is the *democracy index*, the Freedom House's *political rights and civil liberties*, *GDP per capita*… Only, no recent data about the distribution of wealth (i.e. the *Gini coefficient*) in the Philippines is available (the latest goes back to 2015). However, in the last decade of available data, the socio-economic situation in Greece was significantly more equitable than the one in the Philippines.

> on the basis of vague and overbroad charges such as 'subverting state power' and 'picking quarrels and provoking trouble'. Police detained human rights defenders outside formal detention facilities, sometimes incommunicado, for long periods, which posed additional risk of torture and other ill-treatment to the detainees. Controls on the internet were strengthened. Repression of religious activities outside state-sanctioned churches increased. Repression conducted under 'anti-separatism' or 'counterterrorism' campaigns remained particularly severe in the Xinjiang Uighur Autonomous Region and Tibetan-populated areas. Freedom of expression in Hong Kong came under attack as the government used vague and overbroad charges to prosecute prodemocracy activists."[28]

Since the rights of minority groups are a classical test case of the extent to which a country can be considered as a democracy, China fails these tests. Let it be clear: today, democratic rule is about much more than just *the greatest happiness for the greatest number*.

Even though the Ipsos survey illustrates that the group of dissidents are smaller than many Westerners think (which is obviously no excuse for any human rights abuse), it is also important to underscore that Han Chinese are influenced by state propaganda and that they have no idea about the real situation of minority groups and dissidents, often in remote areas. According to a recent special report by the *Committee to Protect Journalists*, China is ranked number five on the list of most censored countries in the world. It says:

> "China has the world's most extensive and sophisticated censorship apparatus. For nearly two decades, the country has been among the world's top jailers of journalists, with at least 47 behind bars as of December 1, 2018. Both privately and state-owned news outlets are under the authorities' supervision, and those who fail to follow the Chinese Communist Party's directives are suspended or otherwise punished, according to news reports. Since 2017, no website or social media account is allowed to provide news service on the internet without the Cyberspace Administration of China's permission. Internet users are blocked from foreign search engines, news websites, and social media platforms by the Great Firewall."[29]

Chinese citizens have few illusions about their press and internet being highly filtered and so, for them, the standard of what they trust and believe is probably what is tangible, for example the fact that millions of middle class people saw their income growing year after year, while their parents and grandparents often grew up at the edge of starvation.

[28] (Amnesty International, 2018, p. 125).
[29] (Committee to Protect Journalists, 2019).

Nevertheless, in private conversations as well as in academic seminars, all kinds of delicate issues can be discussed in China – homosexuality, feminism, Taiwan, democracy… –, only they cannot be published nor expressed at public forums. To most Chinese, this is only natural, for the sake of unity and public order. Even certain unwelcome minority groups smoothly agree to keep their profile low and to accept that the Mandarin-speaking, irreligious (if not Buddhist), heterosexual, party-loyal Han patriot is the standard for all Chinese citizens, as there is no mercy for people openly taking a stance for their deviant opinions.

Social Freedom?

Under the totalitarian rule of Mao, surveillance seemed to be omnipresent. Only since recently, with China's *Social Credit System* (SCS), we realise surveillance can go even much further; today Big Brother uses big data.

In 2009, with the help of a handful of private companies, China started to develop a powerful surveillance tool to measure the trustworthiness of its citizens from the cradle to the grave, but also of companies, institutions, neighbourhoods… Everyone can check his score 24/7 on the internet, but it can also change in real-time, depending on what you put in your shopping cart; buying lots of alcohol suggests dependence and so cost some points, whereas buying many diapers gains a few, suggesting responsibility. This is made possible with the help of 200 million operational smart surveillance cameras with facial recognition and data analysis with sophisticated algorithms. However, SCS also have a significant analogue part by posters in the streets listing the way you can gain or lose points, TV showing the surveillance highlights of the day, and information collectors taking notes of the behaviour of their neighbours.

Scores roughly go from 350 to 950, reflecting your reputation in the eyes of the CPC, based on habits and behaviour, i.e. what you buy, internet and traffic behaviour, bank activities, etcetera. Jaywalking, cheating in online video games, making reservations at a restaurant but not showing up, not often visiting your parents, tossing cigarette butts in the streets, eating in a bus (except for infants and sick people), not cleaning your dog's poops on the street, hanging around in questionable neighbourhoods, and being a friend of ditto people come with a price. On the other hand, donating blood, volunteering for community services, giving up your seat to elderly people in public transport or wishing information collectors a pleasant day is rewarded.

People with low credit can get assistance to improve their rating (online or by patronising government officials) and parents can take educational courses or complete social services, to avoid that violations of their children will be recorded in their credit profiles. The most stubborn citizens however, might end up on a blacklist.

The rewards for a high score include easier access to jobs and loans, priority during bureaucratic paperwork, better options on dating sites, free use of share bikes, having your face on billboards as *best citizen in town*… On the other hand, the lower your credit, the slower your internet and the harder it gets to have access to hotels, banks, assurance companies, schools, universities, and public transport. As of June 2019, according to the *National Development and Reform Commission of China* itself, 26.82 million air tickets as well as 5.96 million high-speed rail tickets have been denied to people whom were deemed *untrustworthy*. There is even a popular app, showing who around you is in debt, just like other forms of public shaming. Sometimes, pictures of blacklisted individuals are displayed on LED screens on buildings or shown in movie theatres before the film starts. The system also includes rewarding individuals for aiding authorities in enforcing restrictions of religious practices, including coercing practitioners of Falun Gong to renounce their beliefs and reporting on Uyghurs who pray and fast during Ramadan. Moreover, on June 27, 2017, at the 28th meeting of the *Standing Committee of the 12th National People's Congress*, a new *National Intelligence Law* was adopted that specified that any organisation (including private enterprises such as *Huawei*) or citizen can be ordered to collaborate with the CPC's intelligence services.[30] This also opens doors for citizens and businesses to increase their scores and therefore having faster internet and better bank facilities.[31]

So far, different testing zones have different rules, but SCS was scheduled to be fully operational in the whole of mainland China (excluding Hong Kong and Macau) by this year (2020), even though Covid-19 might have slowed down the planning.

Between February and April 2018, a survey conducted at the Free University of Berlin among 2,209 Chinese citizens about their approval of SCS led to the results shown on figure 5.[32]

This roughly means that 80% of the respondents approved SCS, 18.7% had no opinion, and only 1.4% disapproved it. Moreover, 72% of those surveyed stated that they were influenced in their purchasing decisions by the system and 18% have changed their posting behaviour in social networks and removed contacts because dealing with certain people might have a negative influence on their own assessment. The survey also showed that strong supporters of

[30] See article 7: *Any organization or citizen shall support, assist and cooperate with the state intelligence work in accordance with the law, and keep the secrets of the national intelligence work known to the public.*

[31] This law also makes deaf conversations on whether or not *Huawei*, or any other Chinese manufacturer, acts on behalf of the Chinese government, sometimes irrelevant, because even if it does not today, tomorrow the Chinese intelligence services can order to do it anyway.

[32] (Kostka, 2018, p. 12).

SCS are more likely to be older and male, have a higher income, and are higher educated.[33] It is also noteworthy that, although people living in urban areas tend to have lower scores than people living in the metropoles, in both cases the approval rating of the system as such is high.

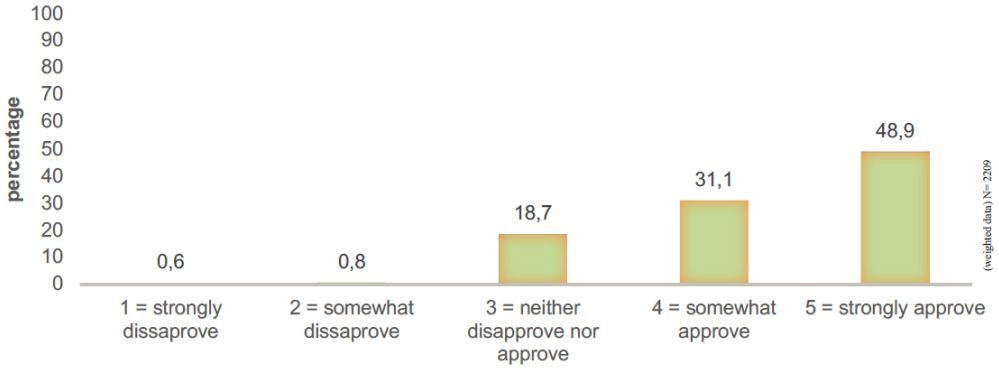


Fig. 5: Overall approval of SCS's, in percentage (weighted).

Just like the Ipsos survey, here too, the outstanding quality of the research institution cannot hinder that Westerners wonder whether citizens of such a highly monitored society speak freely. But once again, even if the numbers are somehow overrated, the actual numbers will always be higher than the average Westerner can understand at first glance. While we wonder how terribly boring a person's life can be if there is really nothing to hide, most Chinese think it is suspicious to question the advantages of SCS. They perceive it as an instrument that offers opportunities to improve quality of life, career opportunities, and to close institutional and regulatory gaps, leading to more honest and law-abiding behaviour in society.

Here too, the dogma of (national) unity and citizens being grateful to the government for having a more luxurious life than their ancestors most probably will play a role, but there is more.

The staggering rise of China's economy and its renewed consumers market went along with all kinds of frauds and scandals concerning toxic baby milk, contaminated strawberries, dubious medication, fake luxury products, and with many millions of people being scammed by false promises on the internet. As a result, a nationwide problem of trust, honesty and credibility has risen and many Chinese consider SCS as a practical tool to get rid at last of this ever-nagging problem. However, the irony of all this is that, meanwhile, such fraudulent practices have more or less become China's trademark in the eyes of many parts of the world, causing a worldwide problem of trust, honesty

[33] (Kostka, 2018, p. 23).

and credibility towards China as a country. The illustrations are numerous and widely known: US economic sanctions, the UK refusing China to contribute to 5G, India closing 59 Chinese apps (including TikTok), Japan encouraging their business companies to leave China, etcetera.[34]

Moreover, the reason why so many Chinese citizens seem to have entirely different opinions on a number of moral concepts that are essential for Western democrats (privacy, free speech, intellectual property, etc.) are not only due to age-old cultural differences. Less than two generations ago, in China there was no such thing as private property. Many even considered the citizen's human body as state property… When generation after generation, people have been inculcated that all possessions belong to the community and that individual needs mean nothing compared to the needs of the state, it would be rather surprising if all of a sudden one specific new generation was freed of all those ideas, especially when that generation is much better served by the government.

On the other hand, our Western gut feeling to be very suspicious about the long-term effectiveness of the state intruding so deeply in private lives and businesses is grounded in many decades of democracy that is inevitably closer to reality than autocracy. It is inherent to autocracies to treat grown-up citizens as children. You can fool one or two rich generations, but who believes that SCS will indeed create a decades-long honest society of happy people? Without increasing repression, it is hard to imagine that the group of dropouts and quitters will not grow.

Thanks to Emile Durkheim, we know, ever since the nineteenth century, that a progress of modernity tends to go along with an increase of mental issues among citizens. SCS is too young to measure its effect on mental health, but not much expertise is needed to realise that a life-long 24/7 monitoring will drive many people crazy, all the more because the rapid modernisation in China already led to an alarming increase of mental disorders.

In March 2019, the *Lancet Psychiatry* published a large-scale epidemiological study of mental disorders among 32,552 Chinese citizens.[35] The weighted prevalence of any disorder, excluding dementia, was 9.3% during the twelve months before the interview and 16.6% during the participants' entire lifetime before the interview, anxiety disorders being the most common class. It is even more alarming that over 90% of people with a mental disorder have never

[34] A PEW Research Center survey confirmed that the outside world is not so sure that China is on the right track. Only 37% of EU citizens have a favourable view on China (57% have an unfavourable view, so 6% is undecided). The only EU country in which a majority has a favourable view on China (51%) is Greece, which, from an economical point of view, might be as well the most desperate EU member state. In the US however, as much as 60% has an unfavourable view on China and in Canada even 67% (even though in 2005 that was only 27%). (Silver, Devlin, & Huang, 2019).
[35] (Huang, Wang, Wang, & Zhaoreu, 2019).

been treated due to various reasons, but so far, China's mental health system is largely insufficient anyway. According to *The Economist*:

> "There remain far too few such specialists to cope with China's needs. The country has about two registered psychiatrists per 100,000 citizens, only about a sixth of the number in rich countries. Few Chinese have access to top-notch primary health care, so mild mental problems can go undetected until they are severe. Hospitals do not offer good care, either. Doctors often prescribe drugs, even when more subtle treatment, such as psychotherapy, might suffice. That is in part because they lack expertise and in part because it is more profitable to dispense pills."[36]

In Mao's day, sufferers were accused of lacking revolutionary zeal, but today's CPC is rolling out its *Healthy China 2030*, including a number of targets to improve mental health. Soon it would be easier for ordinary Chinese to receive counselling in local clinics and schools. By the end of this year, it plans to have a staffed "*psychological counselling room*" in all of its larger local clinics. By the end of 2021, it aims to make counselling available in 85% of primary and secondary schools.

The Autocratic Welfare State vs. Democracy

A closer look at figure 1 shows that the 94% of citizens' satisfaction in China is more than double of both America and the world average (being 42%), more than triple of Belgium (26%) and even more than quadruple of Great Britain (22%).

Then, who is better off, British citizens who are extremely *dissatisfied* with the government of their choice or Chinese citizens who are extremely satisfied with a government that imposed itself to them? One might wonder whether high satisfaction of Chinese citizens gives at least some legitimacy to the CPC, in spite of the absence of free elections, and could the autocratic welfare state be a legitimate alternative to democracy? Even if it is unacceptable for us, maybe it is for others, like the Saudi's or the Chinese.

In fact, the question is irrelevant. In an autocratic welfare state, most clichés of an autocracy still apply (i.e. blatant hypocrisy and ditto state corruption, treating citizens like children, human rights violations), but even when people are ready to accept all this, the question remains: "What should happen whenever citizens are no longer satisfied with their autocratic leaders?" Free elections after all? That would be the start of democracy. Whatsoever, as far as China is concerned, the first priority of the CPC has always been the preservation of its monopoly of power. Therefore, it probably makes more sense just to question the sustainability of the autocratic welfare state in China.

[36] (The Economist Intelligence Group, 2020).

More than once, the collapse of the China Model was predicted to happen even before 2020, but so far, the country proved to be resilient to tackle new challenges because it is constantly adapting according to its changing environment. Nevertheless, it is unlikely that China will maintain for decades its high citizens' satisfaction.

In a way, the lucky majority of China is since more than a decade living in some kind of dream world. Besides an illusion of freedom, the success of the autocratic welfare state thrives nearly solely on material well-being. Even though a communist party rules China, it is obvious that today money is the opium for its people. Opium, however, not only keeps people calm, it also tends to be addictive, meaning that you always need more to get the same level of satisfaction. The last generation had the feeling to witness some kind of miracle in that respect. Twenty years ago, a very large majority of the people constantly lived on the edge of starvation, so the room for improvement was enormous and to repeat this kind of improvement of living conditions is beyond imagination.

Today, there still is room for improvement in many areas of China, but believing that the people will never wake up is unrealistic. Even before the outbreak of Covid-19, the economy was already slowing down. One of the reasons was that many other welfare states do not take China's unlevelled playing field any longer. In the last couple of years, the regime provoked an enormous amount of irritation worldwide, including Europe, North America, Oceania, Asia, and even in Sub-Saharan countries, like Tanzania.

In addition, even though many clichés of a traditional autocracy still apply in China, its autocratic welfare state is almost as complex as a democratic society, albeit very different, but in a complex society, people are highly educated and think hard.

The roll out of a 24/7 high-tech monitoring system of all citizens throughout their entire life while training at the same time an army of mental health workers remains a very strange policy. Down-to-earth democrats wonder to what kind of happiness this will lead. Apparently, the CPC can trick the current generation of citizens into such a policy, but how many more generations will keep on taking that?

China still proves to be resilient, determined and intelligent. The CPC certainly will try to find new ways to maintain as much as possible the support of its citizens, for instance by creating fear, but when the carrot no longer works, the stick will always remain an option.

Conclusion

This chapter raised the question about how it is possible that a large majority of citizens of an unfree country think their country is on the right track, as if freedom is not an essential need, inherent to human nature, in order to enjoy some kind of happiness.

First, it seemed that the lack of economic freedom is something very relative in China, since nowadays most of its citizens enjoy much more economic freedom than they ever had before under communist rule. Moreover, when it comes to international trade, both state corruption and the lack of economic freedom often consist in unfair tricks that benefit China's economy.

Second, as a general rule, there seems to be a considerable correlation between how citizens assess their economy and how they assess their democracy (no relevant data is available with respect to autocracy). Even in a country like the Philippines, that is going through a democratic crisis under president Duterte, its citizens wrongly have a favourable view on the functioning of their democracy, just because most of them feel an upward trend with respect to their income. Therefore, given the staggering economic growth of the last decade in China, it is likely that a lack of political freedom is the price that many citizens are ready to pay.

Finally, also with respect to the lack of social freedom, it looks like Chinese's citizens somehow live on another planet than Western democrats, since hardly anyone seem to have a problem with a 24/7 monitoring of their private lives from the cradle to the grave. Some two generations ago, in China, private property was non-existent; the needs of the state had an obvious priority to individual needs and it is hard to imagine that in the meantime Chinese's minds evolved as fast as their economy. Moreover, the economic growth brought in many charlatans and scammers who created a nationwide problem of trust in trade. Therefore, Chinese citizens consider SCS rather as a practical tool enabling to be freed of that daily irritation, but also as a perfect opportunity to be rewarded for exemplary behaviour and to raise up the social ladder.

So, as in Mao's days, the CPC still imposes its will to the people, however now more often with a carrot and less with a stick. Since that seems to work, China can be called an autocratic welfare state, not only because of its growing material prosperity but also because most Chinese *feel* free, even though, according to Western standards, they are not free in any way.

For the future, it is most likely that the CPC will stay in power and, for the moment, the welfare state it created still seems to be stable, even though there are several reasons to doubt this will not change. It is strongly correlated to the economic growth that is already slowing down and, in many respects, China is a modern society, which will in the future make it harder and harder for the single-party to keep on patronising the people. No revolution is imminent, but the more the citizen's satisfaction is going down, the more the CPC will find other ways to stay in power.

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Sino-Belgian Research Collaborations

A Blessing or a Curse for our Economic Security?

Cind DU BOIS & Pieter BALCAEN

Introduction

In 2015, China launched the MIC25 strategy in order to become a science and technology innovation superpower by 2049. The strategy identifies ten industries[1] in which China aims to lead the world list of manufacturing countries.[2] A very important prerequisite for obtaining this objective consists in decreasing its dependency on other countries for high-technology products. The current boycotts, prohibiting US firms to deliver technological components to Chinese companies such as *Huawei*, reveal the danger of this dependency. Hence, the country has recently initiated a process of catching up and it is closing the gap on research spending with other countries. Figure 1 provides some numbers on Research and Development (R&D) spending in China, Belgium, the EU and the US. As this figure illustrates, while the relative expenditure (in terms of GDP) of China is still lower compared to Belgium and the US, in absolute terms China is catching up to the US, still the number one country in the world with respect to R&D spending. Using the measure of Full Time Equivalent (FTE) researchers, China even surpasses the US.

[1] These ten industries are Next Generation IT, High-end Digital Control Machine Tools and Robots, Aerospace and Aeronautic Equipment, Oceanographic Engineering Equipment and High-technology Shipping, Advanced Rail Transportation Equipment, Energy Efficient and New Energy Automobiles, Electric Power Equipment, Agricultural Machinery Equipment, New Materials, Bio-pharmaceuticals and High-performance Medical Equipment, as well as High-end Equipment Innovation Projects (the last one not being an industry).

[2] (Zenglein & Holzmann, 2019).

Country	R&D spending in		
	$PPP[3]	% GDP[4]	FTE researchers[5]
Belgium	16 513.33	2.76	57 678
China	554 327.83	2.19	1 866 108.80
EU (28 countries)	464 466.44	2.03	1 993 613.02
US	581 553.00	2.83	1 434 415.49

Fig. 1: R&D spending in Belgium, China, EU (28 countries) and the US in 2018.[6]

China's efforts are also paying off. A recent report by the National *Science Board*[7] shows that China's rate of research output has grown almost twice as fast as the world's annual average for the last ten years. Based on data from the scientific Scopus database, this report indicates that in 2018 China outperformed the US by providing 21% of all published scientific articles (compared to 17% for the US and 24% for the EU). Moreover, Chinese researchers appear to be the most prevalent international partners for US researchers. Also Belgian research institutions collaborate more and more with Chinese partners.

As the recent sanitary crisis exemplifies, joining forces in research is crucial to fight current global challenges. However, when these collaborations require technology transfer and/or transmission of sensitive information, they can pose a risk. Especially in relationship with China, concerns have been raised with respect to these risks, both for our economic and national security. Before we discuss the Sino-Belgian research relationships (paragraph three) and the related security concerns (paragraphs four and five), we will describe how scientific research forms an integral part of our economic security. Paragraph six concludes with some important policy implications.

Scientific research as an integral part of our economic security

Since 1998, securing our *Scientific and Economic Potential* (SEP) is an official task of the Belgian State Security.[8] Defined as *"safeguarding the essential elements that enable the survival and optimal development of the socio-economic model"* our SEP is subdivided into four categories: (i) economic sovereignty, (ii) safety of our critical infrastructure, (iii) innovation, scientific research and R&D, and (iv)

[3] Expressed in Power Purchase Parity (PPP) in USD.
[4] Expressed in percentage of Gross Domestic Product (GDP).
[5] Expressed in the number of Full Time Equivalent (FTE) researchers.
[6] (OECD, 2020).
[7] (National Science Board, 2020).
[8] (VSSE, Economische spionage, 2014).

a level playing field for all economic actors.[9] While China poses a threat in all four categories, the risk with respect to scientific research has typically been underexposed. With respect to the other three categories, concrete case studies habitually posing a threat are usually at the root of policy. When in 2016 the Chinese state-owned enterprise *Stategrid* formulated a take-over bid on *Eandis* shares, the discussion with respect to economic sovereignty erupted in Belgium. The same discussion prohibited the take over of the German high tech company *Aixtron* by a Chinese company. US President Trump too regularly prohibits Chinese take-overs of US companies due to *a risk for national security*. The importance of the security of our critical infrastructure is highlighted by the recent debates on the role of *Huawei* in the development of the 5G infrastructure. In the US, Australia and Japan the Chinese manufacturer is banned from the sector. With respect to the fourth category of economic security, China has also recently done quite some efforts. While previously foreign companies were forced to share their technology in exchange for market access in China, a new Foreign Investment Law prohibits this forced technology transfer as from January 1st, 2020. With more than 80% of the counterfeit and pirated goods found by EU customs originating from China and Hong Kong, China is also the number one priority with respect to the protection and enforcement of intellectual property rights (IPRs). While China has substantially reformed its IPR regulation and administration in order to meet the Western complaints, only time will point out the effects of these reforms.[10]

While protection and enforcement of intellectual property form an obvious part of the third category, this category is not limited to IPRs. In its 2019 annual report, the Belgian State Security however explicitly warns for potential vulnerabilities of Belgian universities stemming from their cooperation with foreign, mainly Chinese actors.[11] Because of their research and innovations, universities play a major role in our scientific and economic potential. Of special interest are the 'dual-use' goods, i.e. goods that can both serve civilian and military purposes. The Belgian State Security started a program to raise awareness among our universities with respect to these risks. Previous research indicates that the CPC is waging a whole-of-governance approach in which China's civilian universities, military and security agencies work together (a so-called *military-civil fusion*) to improve China's economic and military strength.[12]Universities remain responsible as first-responders to address these potential threats but also our Belgian enterprises need to be vigilant when entering into research conglomerates with Chinese partners.

It is hence clear that, in order to profit from research collaboration, we need to identify these potential risks. This exercise can only be executed insofar we have a clear and complete overview of the existing partnerships. In the following paragraphs, we will provide a first attempt to map these Sino-Belgian

[9] (Vande Walle, 2013).
[10] (European Commission, 2020).
[11] (VSSE, Staatsveiligheid: Jaarrapport 2019, 2020, p. 23).
[12] (Joske, The China Defence Universities Tracker, 2019).

research collaborations between universities and research institutions. In the fourth paragraph, we give a first estimation of the potential risk posed by these partnerships on our economic security.

Overview of Sino-Belgian R&D partnerships

In order to provide an overview of the existing Sino-Belgian research collaborations, we focus our study on two groups: Belgian universities and the major research institutions.

We contacted all Belgian universities[13]. The dispersion of the group of research institutions as well as the differences in competencies and regulation between the Belgian communities led us to contact only those organisations that are listed on the official 'Belspo[14]'-list.

The questionnaire focused both on the number of Chinese researchers active in Belgian institutions as on the number of bilateral cooperation agreements with Chinese universities and research institutions or partnerships in other projects (e.g. European H2020 projects). With respect to the Chinese researchers working in Belgian institutions, a distinction has been made between students conducting doctoral research (mainly within universities) and non-doctoral researchers (e.g. post-doc or junior researchers). For each type of collaboration, we also requested information on the name of the Chinese partner institution and the research domain.

All respondents were contacted in the period 17-19 June, 2020, with a reminder e-mail sent out 4 weeks later. All but one university provided us with their data. The response rate of research institutions was lower, with only 18 out of 62 institutions. The received information does not always allow tracking the background of the Chinese partner. One of the limitations stems from the fact that universities do not always register the university the Chinese PhD-student originates from.[15] Based on the data of the collaboration agreements

[13] Our sample also includes academic institutions such as *Vlerick Management School* (an international business school providing postgraduate education), *Vesalius College* (providing academic bachelors) and the *College of Europe* in Bruges (an independent university). We excluded the colleges, given that they in general do not engage in research (neither doctoral nor general research).

[14] This department is responsible for the Belgian federal research policy and manages the ten federal scientific institutions. Moreover, the department is responsible for the Belgian contribution to the European Space Agency, the coordination of the research efforts off all Belgian governments and the synchronisation and coordination with international research networks. It therefore represents 30% of the total Belgian research budget (https://www.belspo.be/belspo/index_nl.stm).

[15] From the moment they subscribe at a Belgian university, they are registered as a student active in that university, whereas their 'home institution' is not recorded.

and different memorandums of understanding, we are however able to compile a list of Chinese institutions Belgian universities collaborate with.

Chinese doctoral students and researchers active within the Belgian universities and research institutions

Figure 2 displays the number of Chinese doctoral students and other researchers active in Belgium in the academic year 2019-2020.

	PhD students	Other researchers
Universities	998	25
Research institutions	7	13
Total	1005	38

Fig. 2: Number of Chinese researchers in Belgium (2019-2020).

Even though these numbers already give a clear indication with respect to the presence of Chinese research personnel in Belgium, three factors cause the data to underestimate the real numbers. The first factor relates to the fact that our sample is limited to universities and research institutions identified on the official Belspo-list. Secondly, we only received data from about 30% of the research institutions, which can explain the lower numbers for this group. A third reason for the underestimation is that some universities only register PhD students when they are awarded a grant by the *China Scholarship Council*. Even with this underestimation, the figures indicate the presence of a significant number of Chinese researchers in Belgium. Measured in July 2020, 1005 Chinese doctoral students and 38 researchers are active in Belgium (July 2020)[16]. A comparison with the total number of doctoral students[17] in Belgium underlines the extent of these figures; it turns out that, roughly, some 6% of the total number of PhD students in Belgium comes from China.

Our database also provides information regarding the scientific discipline the Chinese doctoral students conduct their research in. Figure 3 shows the percentage of Chinese PhD students grouped according to their field of research, i.e. Biomedical Sciences[18], Sciences[19], Engineering Sciences[20] and

[16] Our data does not take into account Chinese bachelor and master students.
[17] The most recent data we obtained refers to the academic year 2016-2017. The total number of doctoral students (including foreign students) during this year was 7875 in the Flemish universities (Ecoom, 2020) and 6840 in the French-speaking Belgian universities (Ares, 2020).
[18] This category refers to research in Medicine and Pharmaceutical Sciences.
[19] This category refers to research in Mathematics, Biology, Chemistry, Physics and Geology.
[20] This category refers to research in Bioengineering, Industrial Engineering, Architecture and Computer Sciences.

Humanities & Social Sciences[21]. Engineering Sciences visibly constitutes the main research area chosen by Chinese doctoral students (45%). This clearly reflects the focusses of the MIC25 strategy. Biomedical Sciences only represent 10% of the total of doctoral students.

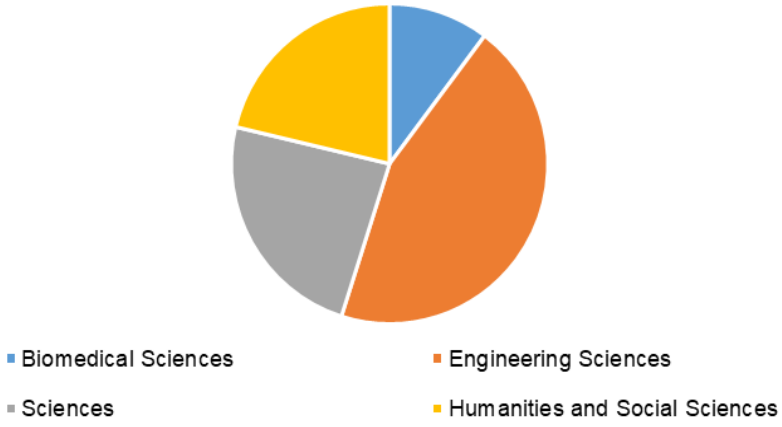

Fig. 3: Chinese PhD students in Belgium according to the field of research.

Cooperation agreements between Belgium and China

Besides the number of researchers, we also considered the partnerships between Belgian and Chinese universities and research institutions. We divided these partnerships into 'bilateral cooperation agreements' and 'Partnerships in other projects' (e.g. Horizon 2020 research projects). Figure 4 clearly shows that the largest share of cooperation is bilateral. Partnerships in other projects are rather limited and are mainly applicable for research institutions (14).

	Bilateral cooperations	Partnerships in other projects
Universities	321	5
Research institutions	26	14
Total	347	19

Fig. 4: Number of bilateral cooperation agreements and other partnerships between Belgium and China in 2019-2020.

The main input of the information on these cooperation agreements relates to the identification of the Chinese institutes Belgium has ties with. Since visa applications do not always mention the sending Chinese institution, we often do not know the identity of the Chinese universities the doctoral students

[21] This category refers to research in Economic Sciences, Languages, Psychology, Sociology and Law.

originate from. The cooperation agreements however allow to indirectly derive the partner universities these students or researchers come from. As security risks largely depend on the identity of the Chinese institution and its possible links with the PLA, this information is of particular importance.

Security Issues

While the possible risk of R&D partnerships remains largely neglected, these collaborations can also lead to an outflow of sensitive know-how and data. These risks cannot be ignored. Moreover, given the nature of the industries identified as primordial by the MIC25-strategy, cooperation not only can be harmful for the competitive position of our companies but they can also pose national security risks. Especially in the domain of dual-use technologies, transfer of expertise poses a serious threat. Technologies such as Artificial Intelligence and cyber software do not only have civilian applications but also have a clear military usage. In 2016, *Military-Civil Fusion* became the official strategy in China to drive innovation simultaneously in both domains and develop advanced, dual-use technologies. This collaboration between the civil and the military sector in research even goes beyond Chinese borders. Framed as *Picking flowers in foreign lands to make honey in China*, China is also in search for foreign expertise in order to develop its military technology.[22] As an overview by Joske shows, the PLA increasingly send scientists abroad. While the top destinations for these PLA researchers are Australia, Canada and the UK, also universities in the Netherlands, Sweden and France welcome PLA scholars. Moreover, these scholars do not always seem to be honest with respect to their affiliation and anecdotic evidence reveals that their military ties are often covered. One of the most famous examples is probably Ye Yanqing, a PLA lieutenant studying at Boston University, without revealing her military background. In addition, Western scientists are linked to Chinese (military) universities. Earlier this year, Charels Lieber was indicted in the US for lying about his affiliation to the Chinese Wuhan University of Technology. This full American Harvard professor earned 50,000 USD per month and received a million dollar budget to establish a new nanoscience lab in Wuhan[23]. Not surprisingly, Wuhan University of Technology is supervised by the Chinese *State Administration for Science, Technology and Industry for National Defence* (SASTIND). Therefore, we have to be cautious, both when welcoming Chinese researchers as well as when sending out our researchers to China.

Although the Wuhan University of Technology is no official military university, it has a 'joint construction' agreement with the SASTIND and it hosts two laboratories dedicated to defence research. The institution also has high-level security credentials, which allows it to participate in highly classified defence & security-related projects. Caution is hence warranted both when welcoming Chinese researchers as well as when sending out our researchers to China.

[22] (Joske, Picking flowers, making honey, 2018).
[23] (Stracqualursi & Jones, 2020).

The China Defence Universities Tracker

The Wuhan University of Technology is not the only private university having close ties with the Chinese military and security sector. The *China Defence Universities Tracker* is a list provided by the Australian Strategic Policy Institute (ASPI), which collects all Chinese institutions posing a security threat. Institutions on this list can be directly related to the PLA but can also be civilian universities as well as intelligence-agency institutions and defence industry conglomerates. Based on their military and security links, their connection to human rights abuses or espionage and their security credentials, the list labels the institutions as very high, high, medium or low risk. *The Seven Sons of National Defense*[24] (i.e. the seven leading PLA-linked universities) are labelled as high risk just like e.g. the private North-China Institute of Aerospace.

Since we have information on the Sino-Belgian partnerships between universities and research institutions, we can compare this data with the ASPI list. Figures 5 and 6 provide this information for the two groups in our sample. The figures divide the total number of Chinese partners with which our Belgian institutions collaborate according to the 4-level risk categories of the ASPI list[25]. As figure 5 shows, almost 70% of the 139 Chinese institutions collaborating with at least one Belgian university seem to pose no risk to our economic/national security but 30% of the institutions do count as medium to high risk. A significant part (10%, i.e. 14 institutions) can even be labelled as high risk! In figure 6, the same chart is constructed for our research agencies. Here, the numbers are more reassuring with almost 90% of the 38 partnering institutions in our study being risk-free.

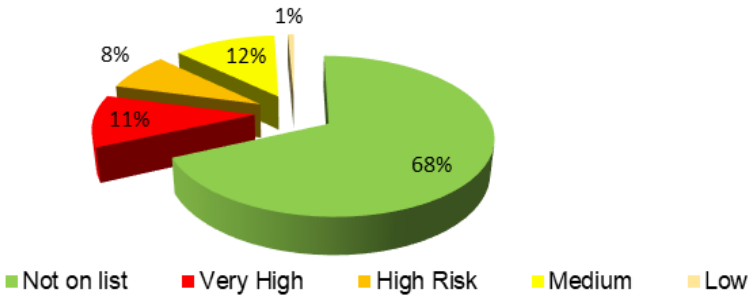

Fig. 5: Risk assessment of partnerships with Chinese institutions for Belgian universities.

[24] These seven sons are the Beijing Institute of Technology, Beihang University, Harbin Engineering University, Harbin Institute of Technology, Nanjing University of Aeronautics and Astronautics, Nanjing University of Science and Technology and Northwestern Polytechnical University.

[25] The figures are based on the concerned Chinese institutions' data. Some of these centres have multiple agreements with Belgian institutions. The total number of partnerships between Chinese institutions and Belgian universities is 234, and 43 with Belgian research institutions.

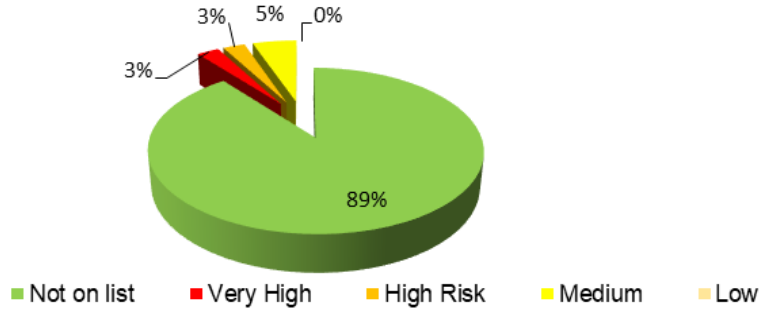

Fig. 6: Risk assessment of partnerships with Chinese institutions for Belgian research institutions.

Conclusions and policy implications

When European Commission president Ursula von der Leyen called China a *"negotiating partner, an economic competitor and systemic rival"*[26], she announced a significant change in the European policy towards China. The need for a level playing field and reciprocity between European and Chinese companies was once again stressed during the most recent EU-China top held in June 2020. The protection of our economic and scientific potential has become an important topic on the European agenda, leading towards numerous policy recommendations.

This debate on economic security predominantly focusses on screening of the incoming foreign investments and protection of IPRs. The issue of research partnerships and the accompanying security risks have largely been ignored until now. When these collaborations however require technology transfer and/ or transmission of sensitive information, they also pose a risk to our economic security. Especially when it comes to China, concerns have been raised with respect to this issue. A significant number of case studies from other countries indicate the occurrence of theft of technology by Chinese researchers.[27] In other cases, individuals from these Chinese military research institutions even serve as a middle-person conducting cyberattacks on behalf of the PLA on Western soil.[28] Moreover, when the research also has military applications, these partnerships do not only pose a risk to our economic security but to our national security as well. A certain level of vigilance is hence recommended.

As with respect to our attitude towards foreign direct investments, the answer is not to close borders and break all partnerships. The recent sanitary crisis highlights the importance of international collaboration in research in order to fight global challenges. However, we have to be aware of possible risks and we need to take into account possible security implications of some R&D partnerships with Chinese partners.

[26] (HR of the EU for Foreign Affairs and Security Policy, 2019).
[27] (Joske, Picking flowers, making honey, 2018).
[28] (Joske, The China Defence Universities Tracker, 2019).

While being a clear underestimation of the true extent of the presence of Chinese researchers in Belgium, this study already shows that this number cannot be ignored. Being more than 1,000 in Belgium coming from various institutions, Chinese PhD students represent a significant part of our junior research population. A closer look at the Sino-Belgian partnerships at the institutional level also reveals some disquieting findings. While more than 30% of Chinese institutions that are partners of our universities have a medium to very high risk profile, the Belgian promotors of these research projects do not always seem to be aware of this fact. This study aims to raise this awareness. Not only the possible danger lies in economic espionage or technology theft, but the CPC also extensively strives to use the overseas Chinese community to enhance its foreign policy agenda and to promote the interests of the CPC (the so-called united front work).[29]

While awareness is an important step, a clear and straightforward policy towards these research collaborations is also crucial. In order to do this, more research is needed to detect and identify ill-intentioned behaviours and intellectual transfers. Second, a central organ is required to conduct a security screening. Moreover, this organisation should also be responsible to track and maintain an overview of Chinese students and researchers currently active on the Belgian soil. To conclude, research partnerships with Chinese institutions can only be a blessing if we limit the risk of their being a curse.

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[29] (Brady, 2017).

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China's Cyber Strategy

A Wake-up Call for the West

Kimberly ORINX and Tanguy STRUYE de SWIELANDE

Daniel Coats, US Director of National Intelligence, declared in January 2019 that cyber operations not only threaten infrastructure but also put mental pressure on US citizens.[1] In May 2019, following a speech by NATO Secretary-General Jens Stoltenberg, Czech Republic's ambassador affirmed: "*The more our critical infrastructures are protected and resilient, the more our enemies will focus on the spirit of our societies*". This sentence pretty much sums up the complexity of cyber. Indeed, cyber, especially Chinese, today poses five major challenges: the vulnerability of infrastructure and data, information warfare in the information environment, cyber sovereignty, new technologies and vehicles of diffusion and raw materials.

The following article is divided into six points. In the first point, we study the vulnerability of our infrastructures. The second and third points are devoted respectively to the dangers of information warfare (fake news, conspiracy theories, social networks) and the question of cyber sovereignty. Points 4 and 5 analyse new technologies (5G, AI, for instance) and the issue of raw materials. Finally, in a last point, we make a series of recommendations to develop a better resilience in relation to the Chinese cyber issue.

Infrastructures' Vulnerability

The first, and probably the best-known vulnerability concerns infrastructures' security and consequently the physical (computers, servers, routers, etc.) and logistical (software, etc.) dimensions of cyberspace. Despite recent examples of hard-type cyberattacks, investments in a country like Belgium remain insufficient. The risks for infrastructures in our ministries and companies are often underestimated while a cyberattack could result in the paralysis of our economy. According to the *Threat Map Checkpoint* website, more than two million cyberattacks are launched every day.[2] Websites are even dedicated to the

[1] (Coats, 2019, p. 5).
[2] "Live Cyber Threat Map" https://threatmap.checkpoint.com.

real-time viewing of global cyberattacks.[3] Of course, not all states are targeted by DDoS (*Distributed Denial of Service*). Indeed, several types of cyberattacks exist. For example, malware, phishing, or even botnets. Among the most famous cyberattacks, notably for their scale, we can cite Estonia in 2007, Georgia in 2008, the Stuxnet virus against the Iranian nuclear program in 2010, or the *WannaCry* malware in May 2017.[4]

There is no shortage of recent examples of global cyberattacks. In May 2020, Chinese hackers managed to access data of nine million passengers of the British airline company EasyJet. In the same period, Americans accused Beijing-linked hackers of trying to steal US research on the coronavirus vaccine. The examples of May 2020 alone do not end there: the Chinese are also suspected of having carried out phishing operations to compromise the Vietnamese government in the context of the conflict in the South China Sea, and hackers of the PLA[5] attacked government companies, foreign, science, and technology ministries in many countries such as Australia, Indonesia, the Philippines, Vietnam, Thailand, Myanmar, and Brunei.[6] Belgium is of course not spared by this kind of attacks. In November 2019, phones and computers of members of the Belgian economic mission traveling to Beijing and Shanghai were hacked, probably by Chinese security services.[7]

Moreover, the President of the European Commission von der Leyen accused China, on June 22 during the EU-China summit, of cyberattacks against European hospitals: *"We have seen attacks [...] on computer systems, on hospitals, and we know the origin of the cyberattacks"*.[8]

At the same time, and although DDoS-style cyberattacks have nonetheless alerted the international community to the potential of cyberspace, some less known elements of the threat are often overlooked, and addressed in the following two sections: namely information warfare in the information environment[9] and the logic of cyber sovereignty defended by China.

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[3] Among others https://cybermap.kaspersky.com/fr/ or https://www.deteque.com/live-threat-map/

[4] (Greathouse, 2014).

[5] Many Chinese cyberattacks are carried out directly by the PLA, more in particular by the Units 61046, 61368 and 61398.

[6] Center for Strategic & International Studies, "*Significant Cyber Incidents Since 2006*". Retrieved from https://csis-website-prod.s3.amazonaws.com/s3fs-ublic/200528_Significant_Cyber_Events_List.pdf

[7] (Gosset, 2019).

[8] (Cerulus, 2020).

[9] Defined by the US Army as "*comprised of and aggregates numerous social, cultural, cognitive, technical, and physical attributes that act upon and impact knowledge, understanding, beliefs, world views, and, ultimately, actions of an individual, group, system, community, or organization [and] also includes technical systems and their use of data*" (Joint Chiefs of Staff, 2018, p. 42).

Information Warfare

Information has become a means to destabilise countries and in particular democracies, as well by external actors but also increasingly internal ones. For our connected societies that are considered as *information societies*, threats to information have become threats to these societies. Although information manipulation is nothing new, countries like Russia and China have become aware that the crisis of confidence in democracies and the speed of dissemination offered by the internet and social networks opened up new opportunities. As neuroscientist James Giordano recognises, the human brain has become the battlefield of the 21st century.

By relying on human cognitive flaws such as confirmation bias (which means that we tend to favour information confirming our hypotheses) or our natural intellectual laziness, which consists in not exercising our critical thinking systematically, manipulating information through the information environment becomes an extremely dangerous means of influence due to the speed of information dissemination. So, what has changed is not how our brains react but rather to how much information we are exposed to, the speed at which it spreads, and the distance that has become almost non-existent.

The decline of Western leadership (the moral leadership, in particular), the loss of confidence in the political elites, the return of populism make populations in democracies vulnerable to alternative speeches and therefore to manipulation via internal actors (political parties, movements, etc.) sometimes at the service of foreign powers, or by direct intervention of these foreign powers. The challenge for Beijing is thus to establish a legitimate discourse that is accepted and shared by a majority of the international community, facilitating the establishment of a *common identity* by altering or manipulating preferences.[10] Having in mind some studies stating that, for example, Americans spend more than 11 hours a day on average and Belgians more than 9 hours *"listening, watching, reading, or generally interacting with the media"*,[11] Beijing has hired members of the *"50 cent party"* to post comments on social networks made from scratch, but as if they were real opinions of Chinese citizens.[12] Since then, it has been proven that disinformation campaigns were orchestrated by China concerning Australia and New Zealand (the two states appearing to be Chinese testing grounds), or recently in the context of the coronavirus.

The Chinese did indeed not hesitate to reinvent the narration of the coronavirus. The amount of misinformation regarding the Covid-19 pandemic is such that the World Health Organization (WHO) has declared it is facing an infodemia. In addition to coming from citizens, this *infodemia* also comes from states launching information manipulation campaigns, including China. *"It may have been the US*

[10] (Prys, 2010, p. 494).
[11] (Insikt Group, 2019).
[12] (King, Pan, & Roberts, 2017, p. 497).

military that brought the epidemic to Wuhan. The United States must be transparent! And must publish their data! The United States owes us an explanation". By posting this tweet on March 12, 2020, Zhao Lijian, spokesperson for Chinese Foreign Affairs, accuses Washington of being at the origin of the coronavirus and of having introduced it on Chinese soil by its army.[13] These accusations have no scientific basis but are popular in conspiratorial circles. In March 2020, newspaper *La Croix* explains: *"That China could be singled out as the source of the coronavirus is unacceptable in the eyes of the Chinese Communist Party (CCP). Everything that links China to the virus must be questioned and disappear from all history books"*. Thus, all Chinese ambassadors abroad have the imperative to spread the following message from their Twitter account (although prohibited in China)[14] or in foreign media: *"If the coronavirus has been successfully deployed from Wuhan, its actual origin remains unknown. We are trying to find out exactly where it comes from."*

Due to the (non-)management of the crisis by the Chinese authorities at the very beginning, Beijing, from the start, lost control over the speech on the coronavirus. By resorting to conspiracy theories, fake news, and others in a structural way, the Chinese authorities simply hope to restore this control. According to Professor Yanzhong Huang, a senior fellow for global health at the Washington-based Council on Foreign Relations:

> "It is no surprise that the government seeks to control related scientific research so that the findings do not challenge its own narrative on the origin of the virus and the government response to the crisis", continuing for saying that "The danger is that when scientific research is subject to the needs of those in power, it further undermines the credibility of the government narrative, making accusations of underreporting and misinformation more convincing."[15]

[13] This is a perfect example of the new generation of Chinese diplomats, called *Wolf Warriors* in reference to a Chinese action movie from 2015. These diplomats are very present on Twitter to back the line defended by the CPC and do not hesitate to resort to conspiracy theories, propaganda, etc.

[14] On this topic it is interesting to follow the Twitter account of the Chinese Embassy in France, the latter not hesitating to relay many conspiracy theories, to launch fake news in order to improve the image of China. Any negative or critical reaction to Embassy tweets is met with propaganda and / or slurs. Some researchers are even blocked. Many Twitter accounts were created between December 2019 and March 2020 as part of this disinformation campaign led by Beijing. Twitter also closed 170,000 accounts in June 2020 *"linked to an online propaganda and disinformation operation supported by Beijing"*. *"The American firm has withdrawn the core of the network, made up of 23,750 highly active Twitter accounts, as well as some 150,000 peripheral accounts responsible for "amplifying" the content disseminated by the main accounts"* ("Twitter removes 170,000 accounts sending messages favourable to China". *Le Monde and Reuters*, June 12, 2020).

[15] (Gan, Hu, & Watson, 2020).

According to Steve Tsang, director of the China Institute of the School of Oriental and African Studies (University of London):

> "(…) the Chinese government had a heavy focus on how the evolution and management of the virus is perceived since the early days of the outbreak". Moreover, "In terms of priority, controlling the narrative is more important than the public health and economic fallout (…). It doesn't mean the economy and public health aren't important. But the narrative is paramount."[16]

Furthermore, unlike the United States, China focuses its narrative on optimism in media coverage of the pandemic. While the US media tends to highlight new cases of infections and trends in deaths, Chinese media reports the number of patients cured. For instance, the China Daily published an article explaining that a woman infected with the coronavirus had given birth to a healthy (uninfected) baby, while CNN preferred to publish the story of another baby who had become the youngest patient with the coronavirus.[17] Carrying out an analysis of the speech, Molter and his team found that:

> "From December 31, 2019 to March 16, 2020, the term 'infected' was commonly used in connection with 'patient' in both the American and Chinese media. However, beyond that common term, there are significant divergences, such as the US media reporting on patients as 'sick' or 'affected', and the Chinese media frequently mentioning treatment- and recovery-related terms such as 'treating', 'recovered', 'discharged', and 'cured'."[18]

This desire to rewrite the discourse of the coronavirus has a dual objective. First, it is to reinforce the image in certain parts of the world which are already very anti-American and anti-Western (Middle East, Africa, etc.) that the United States is the great Satan, thus reinforcing the beliefs of these countries. In other parts of the world, such a speech would sow doubt, consequently weakening the image of the United States. Second, it is about showing the Chinese people that the coronavirus is an attack on China, strengthening nationalism and Chinese pride (rallying around the flag), which in turn allows the CPC to stand up and clear its responsibilities in the case of the management of the epidemic.

As a result of all these actions, the West is losing the war of storytelling, particularly on social networks: vulnerability due to our open societies[19] and

[16] (Kirchgaessner, Graham-Harrison, & Kuo, 2020).
[17] (Molter, 2020).
[18] (Molter, 2020).
[19] The more successful the disinformation activities, the more they will strengthen the *cognitive silos* of extremes, and therefore of populist political parties. This will result in a danger of political, economic and social paralysis.

difficulties in reaching closed societies.[20] As Colonel Qiao Liang of the PLA said, *"[t]he first rule of unrestricted warfare is that there are no rules, nothing is forbidden"*.[21] In this context, the application of overwhelming force on the decisive point, as determined by Antoine-Henri de Jomini, is disruption of society: the civil population and the elites.[22] This is in line with Sun Tzu's thinking that *"[y]ou can be sure of succeeding in your attacks if you only attack places which are undefended"*[23].

Cyber Sovereignty

In a 2013 report commonly referred to as *Document No. 9* (officially titled *Communiqué on the Current State of the Ideological Sphere*), the PRC asserted that *"Western constitutional democracy is an attempt to degrade the current leadership and socialism with the Chinese characteristics of the governance system"* and asserted that the Western universal values are *"an attempt to weaken the theoretical basis of the party leadership"*.[24] The last paragraph of the document also states: *"We must strengthen the management of all types and levels of propaganda on the cultural front, perfect and implement the associated administrative systems and leave no possibility or means of disseminating information, incorrect ideas or views"*.[25]

According to President Xi Jinping, *respecting cyber sovereignty* implies

> "respecting the right of each country to choose its own path to internet development, its own internet business model, its own public policies in matters of internet, and participate on an equal footing in the governance of international cyberspace – avoiding cyber hegemony and avoiding interference in the internal affairs of other countries… [We must] set up a multilateral, democratic and transparent system of governance for the global internet."[26]

In Xi's statement, the key term is *multilateral*. Contrary to the current multi-stakeholder approach to cyberspace, which is the *"involvement on an equal footing of all actors with a vested interest in the internet including businesses and*

[20] There is also another worrying development, namely a possible coordination between Russia and China in the cyber domain. While there is currently no evidence of coordination between Moscow and Beijing in the context of cyberattacks, things appear more complex in terms of the information warfare. Indeed, during Covid-19, it was observed that the Chinese relayed fake news and Russian conspiracy theories and vice versa, which has a multiplying effect. There is also a Chinese willingness to copy Russian disinformation tactics. There is clearly a convergence of short-term interests to weaken Western societies on the part of these two great powers.
[21] (Liang & Xiangsui, 1999, p. 2).
[22] (Greathouse, 2014, p. 28).
[23] (Tzu, 2017, p. 18).
[24] (Document 9: A China File Translation — How Much is a Hardline Party Directive Shaping China's Current Political Climate?, 2013).
[25] *Ibidem.*
[26] Remarks by H.E. Xi Jinping, President of the PRC at the Opening Ceremony of the Second World Internet Conference, Wuzhen, 16 December 2015.

civil society," China vigorously defends the opposite idea, promoting the multilateral or intergovernmental internet governance that considers states as the principal decision-makers.[27] Moreover, cyber sovereignty was described in 2015 by Xu Lin, the head of the *Cyberspace Administration of China* at the time, as the difference between the multi-stakeholder approach and the multilateral approach.[28]

The underlying idea behind the logic of cyber sovereignty is to develop an internet system, completely closed and controlled by the authorities and to bring state sovereignty into the cyberspace, like the famous Orwell work *1984.* To promote its model, China is holding conferences, such as the *World Internet Conference* and multi-week seminars organised for foreign journalists and politicians to encourage countries to spread the Chinese vision and promote its cyber sovereignty system.

Thus, China defends and promotes more and more its authoritarian model and is ready to export a *socialism with Chinese characteristics*, thus offering an alternative to the liberal democracy. To this end, it strengthens its discursive power by proposing new ideas, concepts, and institutions to strengthen control over the definition of regional and international priorities at the political, economic and security levels. This is how Beijing is persuading other states to adopt its vision of world order (with some success already in parts of Africa, Central Asia, and the Middle East). *Digital authoritarianism* is thus encouraged *"as a means for governments to control their citizens through technology, reversing the concept of the internet as the engine of human liberation"*.[29] Through this new process of socialisation, the states will appropriate the norms imposed by China, whose source of leadership will lie in the norms and values that it has managed to internationalise and, to a certain extent, to institutionalise.[30] Thus, by openly positioning itself as an alternative, China *de facto* attracts powers dissatisfied with the international order, but which cannot directly oppose it.[31]

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[27] (Raud, 2016, p. 15) and (Gady, 2016).
[28] (Gady, 2016).
[29] (Shahbaz, 2018, p. 2).
[30] For more details on socialisation read, (Struye de Swielande & Vandamme, Power in International Relations: Modernizing Holsti into the 21st Century, 2015), (Struye de Swielande & Vandamme, Global Swing States: Which Leadership Will They Follow?, 2015), and (Struye de Swielande, Duel entre l'aigle et le dragon pour le leadership mondial, 2015).
[31] It is no coincidence that China is so interested in regional and international organisations: by being strongly active there, it often determines the agenda and consequently the standards and rules of tomorrow. China currently holds the leadership of five United Nations agencies, including the *International Telecommunications Union* (ITU), which specialises in information and communication technologies. Moreover, when its influence is too limited, China creates new institutions or fora. Read on this subject : (Struye de Swielande, Les nouvelles routes de la soie au service de la grande stratégie chinoise ?, 2019).

It is also one of the stakes of the *Digital Silk Road*, an integral part of the *New Chinese Silk Roads*, which includes, in addition to this question of sovereignty, issues related to 5G, telecommunications standards of tomorrow and artificial intelligence.

New Technologies

Google, Amazon, Twitter, Facebook and WhatsApp, vs. Baidu, Alibaba, Sina Weibo, Renren, and WeChat. Tomorrow, global leadership will be determined by the mastery of advanced technologies (artificial intelligence, semiconductors, quantum computing,[32] biotechnology, cyber, 5G, etc.).[33] The Western advantage in these areas is rapidly shrinking:

> "Through a sheltered domestic market, forced technology transfers by Western companies, outright industrial espionage, and intellectual property theft, China is forging technology champions designed to compete with and surpass their international competitors. Through legal mandates that force corporate cooperation with security and intelligence organs, Chinese technology companies serve as the eyes and ears of Beijing in a digital global economy. This model appeals to despots around the world, while cheap prices appeal to everyone else. Make no mistake of the existential stakes as to whether open societies or authoritarian regimes will set the course of the technological future".[34]

China wants to become number one in high tech. In this respect, the MIC25 initiative is a perfect example. Its objective is to move China's manufacturing base higher up the value chain and to develop ten sectors, of which information technology, robotics, green energy and aerospace. As the American Attorney General, Bill Barr, explained:

> "Backed by hundreds of billions of dollars in subsidies, this initiative poses a real threat …. Despite World Trade Organization rules prohibiting quotas for domestic output, 'Made in China 2025' sets targets for domestic market share (sometimes as high as 70 percent) in core components and basic materials for industries such as robotics and telecommunications. It is clear that the PRC seeks not merely to join the ranks of other advanced industrial economies, but to replace them altogether."[35]

It is all about being the first mover and China understands this very well. Five companies have been designated to lead this technological revolution: *Baidu, Alibaba, Tencent, iFlytek,* and *SenseTime*. These companies receive

[32] (Allison, 2019).
[33] (Putin, 2017).
[34] (Rogers & Nye, 2019).
[35] (Barr, 2020).

significant public support due to state capitalism and their connection to the CPC. This is even truer since Chapter V of China's Constitution requires companies with at least three party members to create a party organisation.[36] The legal issue is also linked to the new technologies through the *Cybersecurity Law* that came into force in China in 2017 (and was updated in December 2019). The first version enacted in 2017 applying to all network operators[37] engaged in communications, information services, energy, transport, financial services, etc., in particular, compels companies to cooperate with Chinese security services and to allow full access to data at the slightest request from government authorities.[38] The update version, CMLPS 2.0, goes even further and obliges all individuals and companies (even foreign ones based in China) to comply for security's purpose on governmental request.[39] What might seem like a detail at first glance, since it is a simple national law, can actually have an impact on any collaboration with Chinese companies[40].

Still, in the legal field, regulations in our Western societies that are massive and complex, and cumbersome administratively could also slow down our companies and make them less competitive: *"Technological competition today requires reforms ranging from more innovation, friendly acquisition and procurement policies to greater support for basic research. Collaborations between national laboratories and the private sector is also imperative, as is cooperation with closest economic and security partners."*[41] That said, free societies encourage invention, innovation+, autonomy and initiative, which is more complex in autocratic societies such as China.

The Chinese also file more patents in AI technologies, and graduate three times more computer scientists (185,000 against 65,000) and four times more STEM students (science, technology, engineering, and mathematics) than the United States (1.3 million against 300,000).[42] Thus, Chinese companies and organisations *"own close to a third of international patents in the field of artificial intelligence, account for over a fifth of the world's R&D expenditure and author over a fifth of global peer-reviewed publications (a vast number of which are co-authored with US collaborators)"*.[43]

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[36] Constitution of the CPC, Revised and adopted at the 19th National Congress of the Communist Party of China, October 24, 2017. http://www.china.org.cn/20171105-001.pdf

[37] Defined as network owners, managers or service providers. It includes *"traditional telecom operators, and all entities that can provide products and services through the Internet"* (Aimin, Guosong, & Wentong, 2018).

[38] (Wagner, 2017).

[39] (Descamps, 2020).

[40] Chinese society being less individualistic and appealing more to the sense of community and hierarchy (Confucianism, legalism) will be more loyal to the CPC, especially since the party presents itself today as nationalist and less as communist; therefore, there is not only top-down but also bottom-up nationalism.

[41] (Rogers & Nye, 2019).

[42] (Allison, 2019).

[43] (Taylor, 2019).

The Chinese are also number one in financial technology (fintech). Tencent's *WeChat Pay* (to pay bills, transfer money, borrow money, make investments, donate to charities, and manage bank accounts) has nine hundred million Chinese users, while Apple Pay has only twenty-two million in the United States.[44] The Chinese authority, through its social credit system, among other things, has amassed big data, which will be useful in studying consumer's behaviour: the profiling of 1.3 billion people. Sensetime is one of the leaders in facial recognition, Hikvision and Dahua Technology control a third of the global security camera market, and Tiandy and Wuhan Guide Infrared specialise in thermal imaging.[45] As Allison observes, in an authoritarian society like the Chinese society, facial recognition is equal to control and profit; in democracies, things are more complicated: they *"conceded the race because of concerns over the average individual's privacy, and deep reservations about how this technology could be deployed"*.[46]

With the goal of becoming a leader in the field of AI by 2030[47], China has also taken advantage of the situation surrounding the coronavirus to use all the technological advances already made, for example in data analysis, machine learning, deep learning, or even facial recognition, as a weapon against the new Covid. Thus, China took the opportunity to increase the surveillance of its population during the imposed quarantine. For example, infrared cameras have been placed on police smart helmets, camera systems have been placed in train stations and some metro stations, thus making it possible to automatically detect the body temperature of travellers and the monitoring system. Facial recognition was also used to verify that people wore their masks (wearing made compulsory in China). By emphasising its good management of the crisis and the fact that its particularly restrictive measures have been proven effective in containing the virus, China hopes to better sell its surveillance system to other countries.[48]

Finally, China has also become a major player in developing the vehicles for technology diffusion: submarine cables, Beidou and 5G.

- Submarine cables[49]: *"Chinese state-owned telecom providers China Unicom, China Telecom, and China Mobile are owners of the new SeaMeWe-5 cable*

[44] (Allison, 2019).
[45] (Allison, 2019).
[46] (Allison, 2019).
[47] In 2017, Beijing unveiled its Next Generation *Artificial Intelligence Development Plan*.
[48] Russia is also taking advantage of the current pandemic to precipitate the mass use of technology and facial recognition to monitor its population (Ilyushina, 2020).
[49] *"Undersea cables make instant communications possible, transporting some 95 percent of the data and voice traffic that crosses international boundaries. They also form the backbone of the global economy — roughly $10 trillion in financial transactions are transmitted via these cables each day"* (Schadlow & Brayden, 2020). Beyond the obvious geopolitical stakes, submarine cables have an important role to play in data routing.

connecting Europe, the Middle East, and Southeast Asia. China Unicom also partially owns a cable connecting Cameroon and Brazil. And Huawei Marine Systems[50] *– a joint venture between Huawei and British company Global Marine Systems – is building such cables throughout Africa."*[51] China's goal is thus not only to steal data, but also to dominate the construction and future upgrades of communications infrastructure that will serve e-commerce, e-finance, etc.[52] Chinese ambitions do not stop there: it is also a matter of dominating the rare earth market, essential to achieve the above objectives.

- Beidou: On June 23, 2020, China finalised Beidou (Chinese GPS) – which will be based on 5G – by launching the last satellite of the 30 needed, further strengthening its desire for total technological independence. Beidou offers an alternative to GPS, enabling China to have a bigger hold on infrastructures, the internet of things, norms and standards.

- 5G: China Mobile, China Unicom and China Telecom launched in 2019 the commercialisation of 5G in China and, in July 2020, there were already 100 million subscribers. The three operators are also installing their 5G pylons on the territory with equipment from the Chinese *Huawei* and ZTE. According to Chinese Ministry of Industry and Information Technology, 250,000 5G pylons have already been installed, out of a target of 600,000 by the end of 2020[53]. The deployment of the 5G will also accelerate the internet of things (smart cities, smart cars, etc.) because of the speed, accelerating the communication and data sharing between devices.

Raw Materials

Semiconductors, 5G, data storage farms (datacentres), quantum computers, mobile phones, AI, smart cars and smart cities, renewable energies (solar, wind turbines, etc.), all have rare earths in their components. China controls the rare earth market essential for advanced technologies: 80% of world production and 40% of world reserves.[54] By the 1990s, China had understood the importance of rare earths, as evidenced by Deng Xiaoping's words in 1992: *"The Middle East has oil and China has rare earths"*. Rare earths include seventeen elements.[55] Although not uncommon, their extraction process is complex and highly polluting, and

[50] *Huawei* sold its subsidiary to Hengtong Optic-Electric, a Chinese fibre and cable manufacturer in 2019 (Schadlow & Brayden, 2020).
[51] (Gorman, 2019, p. 76).
[52] (Spengler, 2019).
[53] (Balenieri, 2020).
[54] The most important production site is the Bayan Obo mining deposit at Baotou (Inner Mongolia).
[55] The seventeen rare earth elements are lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, yttrium, and scandium.

they are dispersed in small quantities in many parts of the world. The quasi monopoly on the production of rare earths allows China to control the market by, for example, reducing exports to exert pressures on certain states, lowering prices to avoid that other mines in the world are profitable... By using these means, China is doing everything to ensure that other states remain dependent on its production. Europe, the United States, Japan and others are trying to counter the Chinese monopoly by (re)opening mines (Mountain Pass in the United States, Mount Weld in Australia),[56] by promoting recycling (which is almost non-existent), and by developing alternative materials, but without much success so far. These countries also still have difficulties in establishing strategic reserves of rare earths.

Whether for rare earths or other minerals (lithium, cobalt, coltan, for instance) needed for *lato sensu* new technologies, but also for oil, coal, gas or renewables[57], the fight has just begun, increasing the risk of destabilising parts of Africa, Central Asia, the Middle East and Latin America. The stake is such that the exploration and soon the underwater exploitation will become the new potential Eldorado (and probably the moon in the near future), everywhere the Chinese position themselves like stones on the goban of the game of Go.

In fine, we join Berard, Fayoll, and Pahud who, in their monograph, *Guerres économiques pour l'intelligence artificielle*, demonstrate very convincingly that everything is linked and that for China it is a matter of controlling the entire value chain becoming less dependent on other states. Although we do not have enough space in this article to go into detail and analyse all the elements of the value chain, it is important to acknowledge that China is the only state in the process to control the value chain of new technologies: resources (rare earths, lithium, etc.), data (information on more than 1.4 billion Chinese citizens and 80% of big data in China is controlled by the BHATX)[58], human resources (education, research & development), soft and hardware (quantum computers, semiconductors), algorithms, ecosystem (norms, standards, etc.), vehicles for technology diffusion and use. Their study also shows that the United States and, even more, the EU are in a more vulnerable position. The US is only vulnerable in the area of raw materials, relying in this respect on its allies such as Australia. As for the EU, it is lagging behind its competitors across the entire value chain, depending on the US and even China for resources, datacentres, semi-conductors and so on.[59]

[56] Often these mines are unprofitable and close immediately. In addition, Beijing intends to take control of all these foreign deposits for a very attractive price, as the mines are either no longer exploited or exploited at a loss (Pitron, 2018, pp. 228-9).
[57] All of these new technologies are energy consuming.
[58] These data centres will make it possible to store data on the national territory, the processing of which is an economic gold mine.
[59] (Pitron, 2018, p. 258).

Necessity of a Western Response

Based on the above analysis of China's approach towards cyber sensu lato, the following recommendations for the Belgian economic, political and academic world can be useful:

1. For hard cyber, Belgium has a *Centre for Cyber Security*, which has published national guidelines for securing supply-chain processes. Within the *Computer Emergency Response Team* (CERT.be), there is an *Early Warning System* concerning cyber-threats, incidents and vulnerabilities. Belgium has also a *National Cyber plan*, providing for a common and coordinated cooperation agreement between the various public entities, in case of massive cyberattacks on vital sectors and infrastructures. This plan is divided into three levels (crisis, incidents, small incidents)

   The *Cybersecurity Strategy 2.0* shapes Belgian cyber policy and aims to secure the cyber landscape at all levels, and for all stakeholders. The monitoring, coordination and supervision of the implementation of the *Belgian Cybersecurity Strategy* is the responsibility of the *Centre for Cybersecurity Belgium* (CCB). This Strategy is also part of an international context. For example, the European Union is working on a number of initiatives to promote and improve cyber resilience within the EU. In July 2016, the *Network and Information Security* (NIS) Directive was adopted and transposed in Belgium by the Law of 7 April, 2019 establishing a framework for the security of network and information systems of general interest for public security. The essence of Article 7 of this Directive (transposed in Article 10 of the Belgian Law) requires Member States to draw up a national strategy for network and information system security. In addition, the Cyber Security Act came into force in June 2019, which, among other things, extends the ENISA's mandate to become the *European Union Agency for Cybersecurity*. This regulation also emphasises the need for a *European Information and Communications Technology Cybersecurity Certificate*, with a view to increasing confidence in and the security of products and services, which is crucial for the digital single market. Finally, Belgium also collaborates with EU and NATO partners and institutions (also bilaterally). In spite of all this, Belgium is still lacking financial means and IT personnel. In 2019, P. Slaets, head of the research department at Agoria, stated: "*Year after year, this shortage of digital experts is increasing. Five years ago, there were 10,000 IT vacancies. And now there are 16,000.*"[60] The lack of computer scientists is due to the lack of study opportunities, particularly for master's programme in computer sciences. Another issue concerning hard cyber, where the line between peace and war is extremely blurry, is that the Belgian (Western) approach finds itself limited in both offensive and defensive aspects.

[60] (Duynstee, 2019).

2. Belgium also appears to be even less prepared with respect to soft cyber. Yet, the negative societal impact on our democratic societies is colossal and the latter fail to find adequate answers. China and Russia are weakening our democracies through information warfare by backing populist movements (interfering in Brexit, American and French presidential elections but also the Belgian elections of 2019). This will have a direct impact on our economic development on the short-term. The more our democracies are targeted, the more they are divided, the less they become governable and the less they are able to implement/work out coherent social-economic policies. An investment is needed in countering more proactively this propaganda and fake news, in order to alert citizens. We can observe some timid steps at the EU level. On March 24, 2020, during the Covid-19 pandemic, Josep Borrell, High Representative of the Union for Foreign Affairs and Security Policy, stated in an official statement that there is currently *"a global battle of narratives [...] in which timing is a crucial factor"* as well as a "*struggle for influence*"[61]. In June 2020, the EU announced a new plan to tackle disinformation, based on six elements: 1) understand, 2) communicate, 3) cooperation, 4) transparency, 5) freedom of expression and 6) empowering citizens and societal resilience. This is clearly an important first step, but it would be interesting to create a European task force to counter Chinese disinformation, along the same lines as the *East StratCom Task Force* created in 2015 to combat Russian propaganda and disinformation campaigns. This Task Force could thus develop campaigns aimed at countries under influence while reacting directly on social networks. While the Task Force at the European level could be used to raise awareness, this should also be done through national platforms, as national realities may differ in some respects. Although the document mentions societal resilience, it does not cover one important aspect: free access to information. Many Chinese and Russian media are freely accessible on the internet, while many of our media are charged, which allows the former to reach a large number of people on social networks. This situation makes us extremely vulnerable. We need a counter-narrative strategy considering national, regional and systemic ecosystems, and consistently communicate facts based on data to counter the Chinese and Russian propaganda. With respect to cyber sovereignty, we need to guarantee an open internet, which is endangered by powers such as China.

3. Even though it has not been addressed much in this research, there is a necessity to invest more in education and R&D. Therefore, education budgets should be increased in order to train young people for the professions of tomorrow (geophysicists, engineers, chemists, logisticians, programmers, electronics engineers, mathematicians, linguists, etc.).

[61] Statement by HR/VP. (March 24, 2020). "EU HRVP Josep Borrell: The Coronavirus pandemic and the new world it is creating" Press and information team of the Delegation to China.

Establishing private-public partnerships to create chairs on AI, on information warfare and others should also be considered to study long-term trends. Some Belgian universities (UCLouvain, UMons, Université libre de Bruxelles, Université de Liège, and Université de Namur) made a step in the right direction by creating the *Trusted AI Labs* (TRAIL). The aim of this new centre is to increase research to enable a wider use of artificial intelligence on a daily basis, in particular for the benefit of companies.[62]

4. It will be necessary to invest much more in strategic foresight. Political and strategic blindness results in strategic emptiness, understood as the inability to anticipate inevitable movements, phenomena and trends. Political decision-makers and entrepreneurs risk continuing to drag us into reactive and short-term policies, with the consequence of a general weakening of the state and an increasingly unstable socio-economic situation: *"There are no favourable winds for one who does not know where he is going"* (Seneca).

5. As recent cases have shown, Belgian institutions and industry are still very vulnerable to espionage through cyberattacks (e.g. intellectual property), but also because of the presence of Chinese students in our universities and employees from Chinese origin in our enterprises[63]. A recent Australian study[64] has analysed how the CPC recruits talents abroad with as objective to steal Western technologies and know-how[65]. The CPC relies on at least a network of 600 stations responsible for attracting the best experts to obtain technologies using legal but also *non-transparent* or illegal means. Between 2008 and 2016 nearly 60,000 scholars have been recruited. Although the recruitment concentrates on eight countries (US, the United Kingdom, Germany, Singapore, Canada, Japan, France and Australia), Belgium is clearly also on the Chinese radar, due for example for its renowned universities or chemical sector. Scholars, managers, experts have different motives to work for China summarised in the acronym MICE (Money, Ideology, Compromise/Coercion, and Ego)[66]. Naivety is not an option; a thorough screening is.

[62] Communiqué de presse UCLouvain, September 7, 2020, "Ensemble pour booster l'intelligence artificielle". https://uclouvain.be/fr/decouvrir/presse/actualites/ensemble-pour-booster-l-intelligence-artificielle.html

[63] After spying allegations, the Vrije Universiteit Brussel stopped its collaboration with the Confucius Institute. The danger is also that PhD students and academics at Belgian universities could be co-opted by the Chinese or that China could exercise pressure on universities to avoid events considered as problematic by the CPC.

[64] (Joske, 2020).

[65] These policies are encouraged at the national level, but also at the regional level.

[66] (D'Agati, 2019).

6. Belgian business leaders, (former) politicians and deans should be careful not to kowtow to China: long-term policies and principles should not be sacrificed for the sake of short-term profits: "*The Chinese Communist Party thinks in terms of decades and centuries, while we tend to focus on the next quarter's earnings report*". If enterprises "*continue to bow to Beijing, they risk undermining both their own future competitiveness and prosperity, as well as the classical liberal order that has allowed them to thrive*"[67].

7. We do need a more coherent policy (at both the Belgian and EU level) regarding rare metals and new technologies. First, it will be necessary to avoid, also because of the consequences of Covid-19, that China takes hold of sensible industrial sectors, whether they are large mining or high-tech companies. Second, it will take political courage to consider the reopening of certain rare earth mines in Europe in order to depend no longer so much on China and its potential of intimidation and blackmail.

   The recycling of rare earths would also be an option. Third, encouraging transatlantic and/or European industrial collaboration to be competitive against the Chinese 5G (Apple, Ericson, Nokia, for instance). We need to limit the use of Chinese components in 5G networks in the EU and guarantee safe and secure network technologies. In June 2020, the Belgian government has decided that Chinese enterprises would only be able to contribute in a restricted way to the Belgian 5G networks. If we consider this a prudent first step, at the EU level a coherent policy is still lacking.

8. Finally, it seems urgent to develop an integral and multidimensional strategy at the European level, which takes into consideration the different challenges mentioned in this chapter (hard, soft, cyber sovereignty, raw materials and new technologies): this will require significant financial resources on the part of governments and a will to overcome bureaucratic divisions and state divisions. This holistic strategy can only be successful if the different actors talk to each other and work together in order to use resources and means intelligently and efficiently. It is all about changing the mind-set and culture because, as Peter Drucker explained, "*culture eats strategy for breakfast*".

Conclusion

What this research highlights, is the holistic approach of China's cyber policy. Beijing has an integrated vision – linking resources, cyber, discourses, technologies, norms, etc. – of which we do not measure enough the security, political, economic and social consequences on our democratic societies and what of the liberal order is still standing. Its cyber policy is at the service of its political objective to dominate world affairs in 2049.

[67] (Barr, 2020).

Compared to this holistic approach, Western countries make themselves vulnerable by adopting an approach that is often too compartmentalised, linear, naive and lacking coherence. It is five minutes to midnight for the EU and Belgium!

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Military Balance

Questioning China's Defence Modernisation Trajectory

Alain DE NEVE and Nicolas GOSSET

Introduction

As the third decade of the 21st century started amid a persistent health crisis unknown for decades and the deep global recession caused by its field effects, it appears that new scaling drivers and perceptions of the world order are rapidly building up.

If anything, China's dramatic transformation, bedrock of its "new" fast-rising power, stands amongst the most salient phenomena of the past three decades of globalisation. Having broken the barriers of a centrally-planned closed economy, the country has been fast evolving through exponential growth into a leading manufacturing and export hub of the world, now vying for the status of being the world' largest economy – a position retained by the U.S. since the late 19th century. This transformation comes also with commensurate power and military effects. Whilst the PRC governmentality is still crucially revolving around the internal, "policing" dimension of its national/ regime security, also increasingly building upon augmented technologies of control, its expanding financial and technological capabilities are also translating into the increased military dimension of its might. As China's cloud and capability development expand, the underpinning for asserting its own model (i.e. so-called "*China Dream*"[1]), its views, and growing global geostrategic interests is also becoming stronger. Many of those who believed that a more economically liberal China would produce a more politically liberal China now feel they might find themselves on the wrong side of history. From the airspace over Taiwan to the streets of Hong Kong, the frozen Himalayas and Central Asia's Pamir to the reefs surrounding the Paracel/Xisha islands in the South China Sea, China's increasingly mighty conduct of its foreign policy is prompting a reassessment.

Matters of technological developments and defence industrial strategies appear to be central in this regard, as China's leadership, having demonstrated its will to sustain the modernisation of its military for the past twenty years, now appears to be engaged in a consistent effort to bolster its capabilities in a global context increasingly believed to be one of "*intensifying strategic competition for emerging military technologies*".[2]

[1] (Miller, 2017).
[2] (Raska, Strategic Competition for Emerging Military Technologies, 2019, pp. 65-81).

Bearing this strategic outlook in mind, the article proposes to analyse key trends and developments in the recent evolution of China's defence-industrial and technological base. It is thematically organised according to three sets of questionings: (i) the role and importance of the country's defence-industrial base restructuring in the pace and trajectory of China's military rise; (ii) the objectives, strategic guidelines and framing principles of the country's contemporary defence-industrial strategy; and (iii) the innovation/imitation tension underlying China's defence innovation trajectory in the patterns of global competition for emerging military technologies. In this regard, special attention is paid to questioning China's capacity to gain technological edge through emerging capabilities in cognitive sciences and disruptive technologies, with a particular attention to subsequent developments in the field of artificial intelligence.

China's Capacity Development and the Defence-Industrial Base[3]

It has become a truism that the rise of China as Asia's leading power has far-reaching implications for the regional and global security outlook. As the country's share of Asia's production has grown from 14 percent in 2000 to 50 percent in 2019, and at the current growth rate could reach close to 60 percent within the next ten years[4], the PRC leadership is rapidly expanding its economic backup and aims to secure its supply sources, markets, and logistical chains by expanding China's footprint, and securitising its presence in its regional neighbourhood and overseas. Most significantly, amidst multiple congruent dimensions, this has been translating into a gradual, yet rapid and unprecedented, build-up of China's military capabilities.[5]

Over the past decade, the Chinese military has commissioned a whole set of new systems ranging from "*reconnaissance-strike complexes comprised of advanced ballistic and cruise missiles, air defence systems, submarines, surface combat vessels…*" to "*experimental prototypes of unmanned aerial vehicles, hypersonic vehicles, and fifth-generation multi-role combat aircraft*". These technological developments have resulted in the integration into China's arsenal of legacy weapons and platforms of, for instance, the "*aviation prototypes such as the J-16, J-20, J-31, new helicopters, UAVs to the ongoing construction of a third aircraft carrier, as well as a record number of commissioned ships such as Type 054A, 056 frigates and 052C*

[3] This section and the following draw for a large part on data and strategic documents analyses from (Cheung, Anderson, & Yang, Chinese Defense Industry Reforms, 2017, pp. 1-5), (Raska, China's Defence Strategy and Challenges, 2017, pp. 51-61), and (Raska, Strategic Competition for Emerging Military Technologies, 2019, pp. 65-81). With due credits for those inspirational research works.
[4] (World Bank, 2019), quoted in (Belgian Defence DGStratCom, Strategic Environment Review 2019).
[5] See for instance (Wortzel, 2016), (Rolland, 2019), and (Holslag, 2019).

destroyers".[6] To every record related to military development in peacetime, the catalogue of China's newly developed capabilities is worth noting.

If any, the development of China's military might at sea has been particularly quick and impressive in recent years. As its naval capabilities are fast expanding in an increasingly "blue navy" dimension[7], China is dispatching its forces more frequently beyond the Indo-Pacific waters, along African coasts, in Europe's neighbourhood, especially in the Mediterranean (via the Red Sea), where it has stated the objectives of increasing its presence (along with Russia)[8], but also in the Atlantic Basin, potentially via the Arctic route (aka "*Arctic Silk Road*") [9]. In this respect, the much-publicised *Belt and Roads Initiative* (BRI) itself is coming with a growing security component, as China demonstrates its readiness to back its growing interests overseas with more frequent naval deployments and other military engagements.[10] Taken together, the fast-paced development of the PLA's *inter alia* amphibious capabilities, military build-up of disputed reefs in South China Sea, first base in Djibouti, prospects for such other possible developments in Mapinga (Tanzania), Gwadar (Pakistan) or Hambantota (Sri Lanka), and the expansion of exclusionary A2AD capabilities over adjacent seas[11], are all infusing the image of a more active/assertive military posture in line with consistent geopolitical aspirations and hyper-sovereignty claims.[12] Beijing's share of Asia's defence spending (Russia and Middle East excluded) is now over 50%, meaning that it spends more on defence than its neighbours combined do[13]. With sustained growth of its military expenditures since the turn of the century, and especially for the past decade, China today ranks as the world's second largest military spender ($261 billion in 2019), i.e. still lagging far behind the United States ($732 billion).[14] Progress, however, have been fast since the beginning of the century, and we are now witnessing a PRC that is both militarily and technologically much more capable, hence imposive. However faced with myriad challenges and severely constrained in its persistent internal discrepancies and historical and structural path dependencies, China's economic growth and upward innovation trajectory can only serve his regime's growing aspirations in regional as well as increasingly global geopolitics.

Over the past fifteen years or so, China's defence-industrial and technological base has made remarkable progress in "*developing and manufacturing a broad range of new, relatively modern military systems that* [on the one hand] *increasingly*

[6] (Raska, China's Defence Strategy and Challenges, 2017, pp. 58-60), and (Congressional Research Service, 2020, pp. 13-7).
[7] (Congressional Research Service, 2020) for detailed account.
[8] (Belgian Defence DGStratCom, Strategic Environment Review 2019, p. 24).
[9] (Belgian Defence DGStratCom, Strategic Environment Review 2019, p. 23).
[10] Point developed in (Holslag, 2015), and (Holslag, 2019).
[11] (Congressional Research Service, 2020).
[12] (Shambaud, 2013), and (Holslag, 2019).
[13] (Belgian Defence DGStratCom, Strategic Environment Review 2019, p. 29).
[14] *Cf.* numbers from SIPRI Expenditure Database, as of April 2020.

meet the widening operational requirements of the People's Liberation Army (PLA)"[15], yet, on the other hand, also enabled the country to shift from its historical position of large weapons importer to becoming an increasing exporter, with "*the potential to become one of the world's leading weaponry suppliers*"[16]. In this respect, "*China's increasing presence on global arms markets inherently reflects the relative progress* [of the country's defence-industrial base] *in terms of developing and manufacturing relatively advanced military platforms and technologies*", hence featuring its expanding "*technological, organisational, and financial capabilities*" along with "*China's growing global geostrategic interests*".[17]

In effect, these remarkable developments are the result of a resilient process of reform and restructuring of the Cold-War-inherited structures of China's defence-industrial production that, whilst essentially organisational and technological in nature, also comes as a conceptual "re-framing" of the country's governance practices and processes, with important strategic and geo-economic implications in a context of "*intensifying strategic competition for emerging military technologies*".[18]

At the strategic level, while the development of Chinese long-range missile and nuclear forces has been traditionally characterised as "*conservative, incremental and slow*"[19], China's ballistic missile development is now well into its fourth generation of modernisation as the country continues to expand the capabilities of its missile forces and military space platforms.[20] Following Michael Raska's assessment of that subject matter, "*the qualitative and quantitative progress in the modernisation of inter alia China's strategic assets and capabilities must be seen in the context of the ongoing transformation of the country's defence-industrial complex, especially the aerospace sector over the past decade*".[21] This progress, he further observes, have been made possible by "*the confluence of defence sector reforms, comprehensive military modernisation and integration of innovative operational concepts*".[22] The discussion of that confluence, its consequences, and impact are at the centre of this chapter.

In view of China's remarkable contemporary capacity development and technological advancements (to be continued), the country's defence-industrial base has come a long way in a short period of time, if only compared with the situation fifteen years ago, when "*most Chinese weapon systems were at least a*

[15] (Raska, Strategic Competition for Emerging Military Technologies, 2019, pp. 69-70).
[16] See (Raska, China's Defence Strategy and Challenges, 2017, pp. 58-60), also (Bitzinger, China's Armaments exports, 2017, pp. 47-53).
[17] (Raska, Defence Strategy and Challenges, 2017, p. 60). See also (Shambaugh, 2014, pp. 203-7).
[18] Raska, Strategic Competition for Emerging Military Technologies, 2019).
[19] (Raska, China's Ballistic Missile Modernisation, 2012).
[20] Updated from (Raska, China's Ballistic Missile Modernisation, 2012).
[21] (Raska, China's Ballistic Missile Modernisation, 2012).
[22] (Raska, China's Ballistic Missile Modernisation, 2012).

generation or two behind comparable military equipment being produced at the time in the West or in Russia".[23] Shaped by a quite unique history and distinctive industrial features[24], China's defence-industrial base, whilst successful in supplying the PLA over many decades (also in face of isolation and sanctions), has nonetheless long been striving to meet the qualitative material requirements of the nation's military.[25]

Drawing upon growing recognition, from the early 1990s onwards, of the structural weaknesses and shortcomings faced in the capacity development of the country's defence-industrial base, especially in light of "*recurrent problems with quality and reliability*"[26] and "*foreign dependencies on technological transfers and imports*"[27], the "*sole-source nature of most defence procurements in China*"[28] and the related lack of dynamism caused by state-owned enterprises' monopolies – both causing a shortage of sufficient R&D and technological capability to develop and produce advanced weapons[29] (hence, the consequential dependencies on technological transfers and imports) – have been consistently identified as the key issues to be addressed in order to tackle the "*inability of the PLA to align its capabilities with China's changing strategic requirements*", and to "*catch up with the global military-technological state-of-the-art base*".[30] Those objectives are paramount to China's pursuit of its innovation trajectory.

Resolving those identified shortcomings of China's defence-industrial base, i.e. fostering its ability to provide the PLA with the systems, platforms and technologies enabling its modernisation[31], has been the main thrust of the gradual, yet comprehensive process of defence-industrial reform initiated in the 1990s in order to support the country's capability development, which has led its military might where it stands today. Over the course of years, readjustments and reviews, also as a reflection of the PRC's increasing aspirations and capacities, the transformational trajectory of China's defence-industrial development has been gradually albeit consistently accelerated by a series of "*medium- and long-term defence industrial strategies, plans, and institutional and conceptual reforms*"[32], which "(…) *have introduced elements of competition and globalisation into China's defence industry sectors with the aim to overcome the entrenched monopoly of traditional military-industrial conglomerates*"[33], yet "*without threatening state*

[23] (Raska, China's Defence Strategy and Challenges, 2017, p. 56).
[24] For a discussion of those aspects see (Boutin, Limits of China's Defence-Industrial Transformation, 2009, pp. 216-218), and (Boutin, China's Defence Technologies and Industrial Base, 2017, pp. 39-42).
[25] (Boutin, China's Defence Technologies and Industrial Base, 2017, p. 40).
[26] (Raska, China's Defence Strategy and Challenges, 2017, p. 56).
[27] (Raska, China's Defence Strategy and Challenges, 2017, p. 57).
[28] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).
[29] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).
[30] (Raska, China's Defence Strategy and Challenges, 2017, p. 56).
[31] (Raska, China's Defence Strategy and Challenges, 2017, p. 56).
[32] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).
[33] (Raska, China's Ballistic Missile Modernisation, 2012).

control of key assets".[34] Overall, this ongoing process of industrial/technological capability development has been conducted with a "*double-construction approach*" towards "*mechanisation*" and "*informatisation*" (…) "*in order to upgrade and digitise the PLA*"[35]. Meanwhile, it has also encompassed a process of organisational and conceptual transformation of the armed forces' structure itself[36], with the objective of turning the PLA into a "*fully informatised fighting force capable of conducting joint operations, military operations other than war, and other missions related to China's strategic deterrence its core national interests beyond national borders*".[37] That "*two-track approach*", identified by Raska, Cheung and others, has set up the drive, and defined the principles for both the "*near-term upgrading of existing equipment combined with the selective introduction of new generations of conventional weapons*" – a so-called "*modernisation-plus approach*" – alongside with a "*longer-term transformation of the PLA along the lines of the information technologies-led Revolution in Military Affairs*".[38]

In this respect, an essential aspect of the transformation and qualitative development of China's defence-industrial base in recent years has certainly been the gradual introduction of market mechanisms, as state-owned companies were expected to become more efficient and competitive, and the development of a non-state defence industrial sector that has become increasingly capable and competitive on the international market[39]. Within that process, and as an extension of it, also intended as way to further overcome entrenched barriers to innovation and leverage the PLA's modernisation in somewhat of an all-nation approach, China's long-term military-technological programmes have been increasingly integrated with the country's advancing civilian science and technology base, concurrently increasingly linked to global commercial and scientific networks.[40] We discuss those dynamics of civilian-military convergence that lie at the core of China's contemporary defence-industrial strategy[41] in the following section.

[34] (Boutin, China's Defence Technologies and Industrial Base, 2017, p. 43).
[35] (Ji, 2016) quoted in (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).
[36] For a detailed analysis of the PLA's organisational reforms see (Saunders & Wuthnow, 2016).
[37] (Chase, Engstrom, Cheun, Gunness, & Harold, 2015) quoted in (Raska, China's Defence Strategy and Challenges, 2017, p. 56).
[38] (Cheung, Dragon on the Horizon, 2009, pp. 30-1), and (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).
[39] See (Cheung, Forging China's Military Might, 2014, pp. 54-61). See also (Boutin, Limits of China's Defence-Industrial Transformation, 2009, pp. 216-218), and (Boutin, China's Defence Technologies and Industrial Base, 2017, p. 41).
[40] (Raska, China's Defence Strategy and Challenges, 2017, p. 58).
[41] (Cheung, 2011, pp. 343-44), (Bitzinger and Raska, 2015, pp. 129-62) and (Raska, China's Defence Strategy and Challenges, 2017, pp. 56-60).

From Imitation to Innovation: a tenuous thrust

Overall, the continued capability development of defence-industrial production and R&D ecosystem that has taken place in China over the past decade, notably in areas such as aerospace and UAVs, shipbuilding and armoured vehicles, shows a "*gradual albeit qualitative transition from a copier and reproducer*" over an adapter and modifier, to an "*emerging innovator of selected weapon systems and related advanced technologies*".[42]

As a related outcome, not only are the PLA's operational requirements far better met today than they were twenty years ago[43], thus increasingly allowing to "*align* [its expanding capabilities] *with Beijing's changing strategic requirements vis-à-vis advanced global peers and technologically-superior competitors*"[44], but the range, advancement and quality of Chinese-made armaments available for exports have also made significant progress compared with to the much more basic offerings of the late 1990s[45]. In this respect, the country's increasing presence on global arms markets "(…) *inherently reflects the relative progress* [of China's industrial and technological base] *in terms of developing and manufacturing relatively advanced military platforms and technologies*".[46]

The progressive "marketization" of state-owned enterprises and the parallel development of China's non-state defence sector over the past fifteen years, with "private" operators increasingly undertaking defence R&D and production, has greatly contributed to that qualitative outcome[47]. But perhaps even more critical is the impact of the incremental pattern of policy development driving the integration of civilian R&D and capability development in the framework of military programmes. Thus, whilst the participation of non-state actors to state-led defence R&D and production programmes has been intensifying up its support role in recent years, "national champions" and leading high-tech companies, such as Huawei and Lenovo to name only two prominent examples, also collaborate more actively (should they be compelled to do so) to military programmes along with "classical" state defence operators[48]. Aimed at further enhancement, this kind of participation/ collaboration throughout civilian-military integration processes will continue to contribute to the qualitative development of China's defence-industrial base.

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[42] Adapted from (Raska, China's Ballistic Missile Modernisation, 2012).
[43] (Boutin, Defence Technologies and Industrial Base, 2017, p. 42).
[44] (Cheung, Anderson, & Yang, Chinese Defense Industry Reforms, 2017, p. 2) and (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 71).
[45] (Raska, China's Defence Strategy and Challenges, 2017, p. 59). For a detailed account of China's armaments exports in recent years see (Bitzinger, China's Armaments exports, 2017, pp. 47-53).
[46] (Raska, China's Defence Strategy and Challenges, 2017, p. 55).
[47] (Boutin, Defence Technologies and Industrial Base, 2017, p. 40).
[48] See (Breslin, 2013, pp. 48-49), (Shambaugh, 2013, pp. 193-95) and (Boutin, Defence Technologies and Industrial Base, 2017, p. 41).

This comes with important implications. Indeed, As non-state actors stand in a much better position to engage foreign industrial partners, hence also explaining governmental efforts made to enable their integration into state-led R&D and production in view of the recognition of this effect[49], the impact of restrictions placed upon China's access to dual use technologies, such as most notably the control and arms sanctions regime imposed by the United States and European countries in the aftermath of the Tiananmen events, whilst continuing to impede Beijing's efforts to overcome the pitfalls of its defence industry by drawing on foreign partnerships, finds itself increasingly lowered in effect by the changing patterns of China's defence-industrial capability development.

On the one hand, "*a number of states continue to provide components, sub-components, and complete systems to China*".[50] Certainly, Russia – China's first and single most strategic partner when it comes to arms development and production – plays a critical role in this respect. This is however not the sole way, as it also often happens, on the other hand, in a more incidental and co-incidental manner: "(…) *taking the form of items supplied for what ostensibly are civilian production programmes*", but also "(…) *through the integration of Chinese industry into transnational production and R&D processes which are difficult for states to monitor and control due to their nature*".[51] In this respect, stakeholders' situational awareness should be raised when participating into joint development and R&D processes with potential dual-use dimension and/or Chinese partners' contributions to state sector-led R&D and production processes. This is all the more important since China is "(…) *actively engaging in industrial espionage in an effort to circumvent restrictions imposed by sanctions and national export control regimes*", enabling in turn its own developers to overcome barriers and speed up the development process at much lower cost.[52] While this is matter of public knowledge[53], the full magnitude and consequences of the phenomenon are hardly quantify. However widespread it may be, one should also consider overall this is "*probably less important to China's defence modernisation efforts than legitimate commercial ties* [which] *now are quite extensive* [and which will] *grow as industrial development in China sees high-technology state and non-state enterprises progress further up the value chain*".[54] R&D/industrial deception and espionage remain nonetheless critical issues that must be summed up with more conventional forms of offshore engagement when assessing the governance of innovation policy and the patterns of technological experimentation and implementation drawn by China in the pursuit of its defence-industrial development.

Thus, however impressive the progress made by the country in modernising and developing its national defence-industrial base over the past twenty years or so may appear, and notably translated in the accelerated upgrade of certain

[49] (Boutin, Defence Technologies and Industrial Base, 2017, p. 42).
[50] (Boutin, Defence Technologies and Industrial Base, 2017, p. 43).
[51] (Boutin, Defence Technologies and Industrial Base, 2017, p. 44).
[52] (Boutin, Defence Technologies and Industrial Base, 2017, p. 44).
[53] (VSSE, Sureté de l'État: Annual Report 2019, 2020, p. 23).
[54] (Boutin, Defence Technologies and Industrial Base, 2017, p. 45).

endogenous technological development capabilities and a lowered dependence on foreign arms exports in recent years[55], China's drive for continued indigenous research and capability development still appears to be impeded in its innovation trajectory by significant obstacles, both political and structural, organisational and technological loopholes, and the Cold War-inherited pace of technological progress that have yet to be abated. As Kenneth Boutin observes in his comprehensive assessment of China's defence technologies and industrial base: "*The autonomy* [of China's defence-industrial base] *has been achieved at the expense of technological progress, which has failed to keep pace with the rate of progress in the states that provide its developmental benchmarks*". This is manifest, he further contends, in "*the extent to which defence technological advances in China continue to depend on original R&D undertaken elsewhere*".[56] When explaining that continued struggle in China's quest for innovation, Michael Raska sums up:

"*The confluence of historical legacies of centralised planning coupled with segmented technological, institutional and management deficiencies, such as overlapping planning structures, widespread corruption and bureaucratic fragmentation, have precluded the Chinese military-industrial conglomerates from fully leaping ahead on the innovation ladder so far*".[57] Others remaining obstacles to innovation include: "*difficulties in ensuring structural strength, quality control, and manufacturing process standardisation, (…) evident for example in the development of engines required for next-generation aircraft*".[58] Amongst those prevailing issues, the paucity of domestic competition dynamics, related patterns of underinvestment in R&D by state industrial operators, and the persistent shortfalls in their capacity to innovate and match the qualitative standards met by other major armaments producers[59], are often pointed as the most critical challenges facing China's defence-technological innovation trajectory amidst the series of reforms and strategies introduced over the past two decades. As a result, the country's defence industry still appears to lack "*sufficient capable, fully integrated endogenous capabilities for high-technology innovation and production*", whilst in the meantime, "*Western armaments producers continue to outpace China when it comes to most military technologies, particularly in areas such as propulsion (aircraft/missile engines), navigation systems and defence electronics, and high-end composites*".[60]

So far, the country, though its increasing focus on the development of state-of-the-art capacities in the defence field, has largely been copying its providers, often competitors, and sometimes prospective adversaries – primarily

[55] According to recent SIPRI dated, compiled in (Raska, China's Defence Strategy and Challenges, 2017, p. 60), updated by authors, China's share of global arms exports rose from 2.8 to 5.6% between 2010-19, making it the world's fifth-largest supplier in 2019 (following the U.S., Russia, France and Germany).
[56] (Boutin, Defence Technologies and Industrial Base, 2017, p. 40).
[57] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70) and (Cheung, Anderson, & Yang, Chinese Defense Industry Reforms, 2017, p. 4).
[58] (Raska, China's Defence Strategy and Challenges, 2017, p. 60).
[59] (Boutin, Defence Technologies and Industrial Base, 2017, p. 42).
[60] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 70).

the United States, yet also European and Russian producers. As a result, "*China continues to rely on foreign states for developmental benchmarks in many categories of arms and there is an enduring concern about the quality of the arms produced by the Chinese industry*".[61] In particular, American technological breakthroughs have long been the standard criterion for China's military. Lately, China's political-military leaders seem nonetheless to have realised mimesis is not the best posture to adopt in order to challenge a superior high-tech competitor/ adversary at once. For several years now, China has been on the lookout for innovative capabilities aimed at overcoming the *technological catching-up* strategy the nation has long been pursuing in the field of military and space assets. Beijing now appears to be searching more actively for ways to generate a reversal of the global military balance. Even though many examples suggest that China has often been trying to narrowly find inspiration in the American way of military modernisation, emerging concepts and niche technological developments tend to indicate China may also evolve from a mere *copy-paste* posture in its effort to rise its defence-industrial base to the challenges and promises of the twenty-first century.

As far as medium- and long-term development prospects are concerned, it remains to be seen whether – or rather, to what extent – the ongoing technological capability development of China's defence-industrial base will make it possible to overcome the puzzles of its stock of endogenous innovation capital in such a comprehensive and successful manner that it could manage to turn its defence R&D and industrial operators into "*leading critical technological innovators of major weapon platforms and systems comparable in sophistication to those produced by global defence industrial powers*"?[62] Whereas it is generally believed such a dramatic turn is "*unlikely in the short term*", China nonetheless actively continues to "(…) *seek niche technological developments that could potentially revolutionise not only the PLA but also global defence markets by providing indigenous next-generation advanced weapons systems*"[63]. Strategic competition for emerging military technologies in areas such a robotics, neuro-technology and cognitive sciences (artificial intelligence, autonomous weapons, decision support systems, etc.) appear to be a new defining frontline in this regard. It is with due regard that we are now proposing to question China's capacity to shape the future innovation trajectory of the global defence industry, and eventually pursue future military dominance through emerging capabilities in cognitive sciences and disruptive technologies, with a particular focus on developments in the field of artificial intelligence (AI).

[61] (Boutin, Defence Technologies and Industrial Base, 2017, p. 42).
[62] (Raska, China's Defence Strategy and Challenges, 2017, p. 60).
[63] (Raska, Strategic Competition for Emerging Military Technologies, 2019, p. 71).

China's Quest for Disruptive Technologies: strategic focus on AI

Whereas few people in the West has hardly heard about *Interstellar Glory Space Technology* Ltd. (IGST), also known as iSpace, this Chinese private company figures among the community of new actors with which the central government intends to create military-civil fusion initiatives in order to propel the nation into the 21st century. A very representative example of the new Chinese technological ecosystem aimed at overtaking foreign competitors, this start-up has developed an artificial intelligence (AI) control system for launch vehicles aimed at reducing the cost of recycling the rockets through controllable recovery and use[64]. On July 25, 2019, iSpace became the first Chinese private firm to achieve orbit with its Hyperbola-1 launch vehicle from the Jiuquan satellite Launch centre[65].

Few months earlier, President Xi had declared: "*Under a situation of increasingly fierce international military competition, only the innovators win*"[66]. From a technological point of view, the quest for disruptive innovation constitutes today the centre of gravity of China's military modernisation trajectory. Through the above-mentioned processes of military-civil fusion, the PRC's leadership hopes research in emerging technologies will fuel and sustain the continued development of the nation's economy and contribute to its military modernisation and achieving great power status[67]. In that line of thought, China's Next Generation *Artificial Intelligence Development Plan* (AIDP), released by the State Council in July 2017, provides a more detailed roadmap for developing an increasingly integrated AI ecosystem. China has also defined a calendar for that AI development: catching up the West (the US in particular) by 2020; overtaking the West by 2025, and becoming a leader in AI by 2030[68].

Fundamentally, Chinese initiatives in the field of AI appears to be driven by growing anxieties about falling behind the US, especially in regards of military innovation. This concern does not only relate to the conventional domain but actually appears to be a general state of mind within the PLA regarding all its components, especially those in charge of the nuclear forces. Research in AI/ML (i.e. *Machine Learning*) seeks the modernisation of remote sensing and situational awareness capabilities. One of the greatest fears among the PLA comes from the presumed inability of their detection systems to identify a stealthy or prompt

[64] (European Space Policy Institute, 2019, p. 9).
[65] This success achieved by the company followed two failures by Landscape in October 2018 and OneSpace in March 2019. The Hyperbola-1 vehicle suffered from several delays. Initially, it was planned to be launched in April 2019, then in June 2019. These calendar slips were announced without transparent explanation. (Chinese iSpace achieves orbit with historic private sector launch - SpaceNews)
[66] (Kania, 2019, p. 28).
[67] (Ernst, 2020).
[68] (Fischer, 2018).

precision strike against the territory or the national armed forces. While – given previous incidents – the US military authorities are preoccupied with concerns that alarms or early warning systems could produce *false positives*, Chinese authorities are conscious that one of the main weaknesses of their military apparatus resides in the limitations of their remote sensing capabilities[69]. The Chinese authorities' consciousness of shortfalls in situational awareness and early warning systems led the PLA to aim at proceeding to an information technologies-led *Revolution in Military Affairs* (RMA). Despite some mimicry with US concepts, China has however always avoided esoteric notions such as those of *Singularity* when it comes to the future of AI. Rather, China's approach to AI appears to be very pragmatic, as tends to prove the institutionalisation of social control. The widespread development of facial recognition software used through millions of surveillance cameras is illustrative of how AI is already deeply anchored in China's public life, especially in the area of safety and control.

AI as a "Technological Leapfrog"

From a military point of view, emerging technologies such as nanotechnologies and AI are often seen as a determining group of research domains to proceed to a *technological leapfrog*. Chinese political-military leaders assess that a new RMA is underway, presenting urgent challenges as well as new opportunities for the country and its armed forces[70]. In this context, President Xi once declared: "*We must attach great importance to the development of strategic frontier technologies, striving to surpass the predecessor as latecomers, turning sharply to surpass.*"[71] China's military initiatives in the field of artificial intelligence are motivated by an acute awareness of global trends in military technology and operations. Against the backdrop of growing US antagonism within China's military strategy, AI and associated technologies are considered a force multiplier eventually aimed at transforming its military into a *world class* force by the mid-century. In recent years, the PLA has redoubled efforts to pull military innovation to further edges. Among the numerous decisions undertaken in order to sustain Chinese initiatives, new theories, technologies and institutions have been set up in order to compete with the US, still leader (by far) in these fields[72]. China's defence industry has been pursuing major investments in robotics, swarming and other applications of AI and machine learning. However, one has to insist on the fact that many new weapons described by Chinese authorities as *autonomous* or *intelligentized* are built upon prevailing efforts in research and technology. It

[69] (Saalman, 2018).
[70] In August 2014, the Politburo dedicated a study session to the issue of new trends in global military developments and defence innovation. At the time, Xi Jinping discussed the emergence of a new RMA and called China to keep the pace with the times by playing its part in order to narrow the gap and achieve a new leapfrogging as quickly as possible. See (Kania, 2019).
[71] Quoted in (Kania, 2019, p. 32).
[72] (You & Dingding, 2018, p. 245).

is thus difficult to weigh the exact degree of sophistication of these so-called disruptive armaments, as they seem to be an inheritance of existing systems and missile technologies. Moreover, the boundary between *smart weapons* capable of great precision and weapon systems partly or fully autonomous is particularly complex and often contested by specialists. To date, there is indeed no consensus on how to define a disruptive technology, excepted by examining its impact on the balance of power afterwards.

AI is believed to be a strategic technology that presents unique opportunities for China. At the October 2017 19th CPC Congress, Xi Jinping urged the PLA to accelerate the development of military *intelligentization* and reinforce joint operations capabilities and all-domain operations capabilities based on network information systems. China's New Generation Artificial Intelligence Development Plan calls for a strengthening of the use of new generation AI technologies in support of several capacities including, e.g. command and decision-making, military deductions, war-gaming, operations research or defence equipment factory processes. China's political-military leadership believes that advances in AI will catalyse a transformation from today's *informatised warfare* to future *intelligentized warfare*. In that process, AI is believed to constitute a critical enabler with the potential to prove truly disruptive.

Chinese AI Programmes: framework and content

According to the July 2019 White Paper on China's National Defence in the New Era, "int*elligentized warfare is on the horizon […]. A new Revolution in Military Affairs is on track, which will change the very mechanisms for victory in future warfare.*"[73] Chinese military scientists and strategists envision AI and intelligent weapons playing a crucial role in future warfare.

According to the PLA, an AI weapon– i.e. using AI to pursue, distinguish, and destroy enemy targets automatically – is composed of information collection and management systems, knowledge base systems, decision assistance systems, mission implementation systems, etc.[74] Debates among Chinese experts and strategists resulted in the preference given to the concepts of *AI weapons* or *intelligentized weapons*, thus avoiding any reference to the notion of *autonomous weapons*, at least for two reasons. First, the idea of *autonomous weapon* is mainly anchored in Western military debate, and has thus an American connotation.

Second, the terminological difference may be subtle, yet it has significant impact for it is more focused on the *smartness* or *intelligence* of weapon systems in selecting and engaging targets. This is a way for the Chinese military to make a distinction between *automation* and *autonomy*.

[73] Quoted in (Kania, 2019, p. 34).
[74] (Kania, 2019, p. 32).

Chinese military leaders conceive of AI as a critical vector of military modernisation. Yet, the PRC's *Central Military Commission* has still not defined a policy or an official strategy that formally identifies plans and priorities. Some documents, such as the *New Generation Artificial Intelligence Development Plan*, call for the Chinese Navy (PLAN) to "*strengthen the use of AI in military applications that include command and decision making, military deductions and defence equipment*." Yet, official statements calling for "*accelerating the development of military intelligentization and improving joint operations and all-domain combat capabilities based on network information systems*" (sic) appear to be the sole guidelines given by public authorities to pursue military applications of AI in order to integrate them across the whole system for future operations so far. Moreover, emerging emphasis on *military intelligentization* appears to extend beyond AI-enabled systems and autonomy to include the development of weapon systems leveraging adaptive control or involving autonomy in various aspects of operation[75].

So, how far has China engaged the weaponisation of AI at present?

We know that the PLA is actively pursuing AI-enabled systems in its military modernisation. However, it is very difficult to have a clear view about the extent of this process. Yet, we tend to consider that the lack of any exhaustive knowledge of China's plans to integrate AI in the military should not make obstacle to any prospective reflection. Over the past three decades, concealment of clandestine capabilities has been China's dominant state behaviour[76]. The PLA has fielded a growing number of robotic and unmanned systems, as well as advanced missiles with precision guidance, some of which may possess at least limited degrees of autonomy[77]. The PLA Ground Force (PLAGF) has concentrated on robotics and unmanned ground vehicles, which could be used for logistics. The Chinese Navy (PLAN) is experimenting with unmanned surface vessels that may operate with some autonomy and is reportedly developing autonomous submarines, while the Air Force (PLAAF) is reported exploring options for manned-unmanned teaming. The PLA Rocket Force (PLARF) can leverage use cases in remote sensing, targeting and decision support, and its missiles could be augmented to higher levels of automation. There are also indications that the PLA Strategic Support Force could apply advances in AI to its missions of space, cyber, electronic, psychological warfare, etc.[78] In all sum, the PLA can today build upon the augmented strength of the nation's defence industry, especially in the field of armed drones and advanced missiles, in order to proceed to some advancements in terms of autonomy.[79]

[75] (Shrivatsava, 2021).
[76] (Green & Long, Winter 2019/20).
[77] (Kanaia, 2020).
[78] (Shrivatsava, 2021).
[79] Reports also suggest that the PLAN has operated a range of undersea gliders and unmanned underwater vehicles for scientific and military missions. These tests included the HN-1 glider that was previously used in exercises in the South China Sea in 2018. However, limited technical information impede to have more details about these. (Kania, 2020).

Indigenous Chinese developments of military AI and autonomous systems is yet a worrying issue, but not as much as the perspectives of development for the export market. The China Aerospace Science and Industry Corporation (CASIC) has reported recently having opened factories for the CH-4 platform – an autonomous aircraft – in Pakistan, Myanmar and Saudi Arabia.[80] As we have seen, the main asset of the Chinese export industry is the relative affordability of its products, even those equipped with some of the most advanced technology developed by Chinese engineers. It helps to explain why the United States and other European leaders of arms exports suffer setbacks in those countries.

Most recently, China has claimed to be rapidly advancing AI capabilities for a next-generation stealth fighter expected to emerge by 2035. The objective of the PLAAF is to provide China with a fighter-jet able to sustain longer combat ranges, longer endurance and stronger stealth capabilities. According to the J-20 designer, the future aerial platform will also provide its pilot with *easy-to-understand* battlefield situation images and predictions[81]. The list of these requirements appears to be very close with the F-35 sensor-fusion programme. Data coming from electronic warfare, space, radar warning receivers and cyber will rely on advanced algorithms able to perform analytics upon a vast array of incoming information[82].

Not only does the PLA invest in the development of AI-enabled weapon systems but it also appears focusing its efforts on leveraging AI for command and control purposes. The much publicised AlphaGo's defeat of Chinese champion Lee Sedol in the game of Go in spring 2016 was lived as a dramatic event for the PLA. It caught on the attention of strategists to the military potential of AI, particularly for future command decision-making. As a result, the CMC Joint Staff Department urged the PLA to rapidly progress on *intelligentized command decision-making* and hurry up the construction of a joint operations command system by taking advantage of the potential of AI, as well as big data, cloud computing, and other advanced technologies. PLA academics and strategists place great expectations in the ability of AI to transform command decision-making by augmenting or perhaps someday displacing human commanders. PLA's writings on intelligentized warfare regularly debate about the forthcoming role and position of humans in warfare. Discussions gather many representations of the future of warfare; some experts anticipate confrontations among intelligent machines while others still believe that the human factor will remain decisive in all kinds of contingencies.

[80] (Lagneau, 2017).
[81] (Xuanzun, 2020).
[82] In the integrated aerial combat system imagined by the PLAAF, the aircraft should be able to form a network, draw real-time integrated situational images, create multiple attack routes, and transmit target information across mission areas in real-time. Such performances could not be reached without a strong on-board AI system.

Looking Disruptively Ahead

There exists currently no direct evidence that the PLA has deployed a weapon system that could be unequivocally deemed as fully consistent with the definition of *intelligentized weapon*. Yet, there is no doubt that the Chinese military is resolved to pursue its efforts towards the development of AI military systems. To this end, an original and dedicated ecosystem has emerged during the last years. It gathers representatives of the defence industry, commercial enterprises, laboratories and expertise centres. This ecosystem is supporting the military-civil fusion ambitioned by state authorities in order to address the challenges associated with AI technology. *The Key Laboratory of Precision Guidance and Automatic Target Recognition* at the *PLA National University of Defence Technology* is now exploring a wide range of target recognition techniques based on neural networks. Another example of China's resolve to progress on disruptive technologies is *Tianjin Binhai Artificial Intelligence CMI Centre established in partnership with the Academy of Military Science*. This institution is actively pursuing developments in autonomy and coordination of unmanned systems for undersea drones.[83]

The rise of new emerging aerospace capabilities could also be expected. The CASIC is indeed pursuing breakthroughs in core technologies including target detection and recognition techniques based on deep learning and deep neural network compression and smart sensors. The ambition is to gain the capacity to proceed a combination of multiple data from several radar sources[84]. This weapon system could be controlled by commanders in real-time or launched in a fire-and-forget mode. It could also reportedly integrate new orders during its flight. Last but not least, the future missile envisaged by the CASIC would operate with sophisticated capabilities in sensing, decision-making, and implementation. Some observers suggest that these capabilities could include a certain level of cognition and continual learning abilities.[85]

China's naval forces could also benefit from improvements following advances in AI and autonomy in the future. In September 2018, the *China Shipbuilding Industry Corporation* unveiled a multi-purpose unmanned surface vessel named JARI, designed for use by the PLAN and also intended for export as a warship.[86] Another programme, the Sea Iguana, is based on an unmanned surface vehicle that can be leveraged in support of future amphibious operations. It has also been reported that the PLA has invested in the development of AI enabled submarines to advance Chinese capabilities in undersea warfare. These

[83] (Kania, 2019). See also (Levesque, Military-Civil Fusion, 2019).
[84] In 2016, the CASIC organised an innovation competition for AI-based radar target classification and recognition. It involved companies and universities with AI research teams active nationwide. The aim was to develop solutions of intelligent processing for targeting. Some experts alleged that insights emanating from these exercises could lead to the development of a future cruise missile with high level of AI autonomy.
[85] (Saalman, China's Calculus on Hypersonic Glide, 2017).
[86] (Navy Recognition, 2018).

projects could be included in a classified military programme, t*he 912 Project*.[87] The introduction of AI/ML techniques for target detection, recognition and decision-making support is, according to Chinese points of view, a first step toward the development of fully autonomous weapons on land, air and sea.

As a whole, current progresses cumulated in the field of AI and advanced sensors could have destabilising effects on the global military balance. First-hand China experts also fear the country could soon develop and deploy smart sensors associated to new AI/ML techniques aimed at detecting with unprecedented accuracy nuclear submarines displacements across the globe. If China – or countries to which China would export its technologies – achieve such developments, important questions would then arise about the reliability of nuclear dissuasion[88].

In addition to those developments, China's posture on unmanned systems proliferation generate growing anxiety abroad, especially in North America but also beyond. In November 2019, US Secretary of Defence, Mark Esper, stated that Chinese weapons manufacturers are selling drones to the Middle East, presenting those systems capable of full autonomy, including the ability to conduct targeted strikes. It appears the Pentagon had then in view a system developed by the Chinese company Ziyan. Only a month before, the Chinese delegation to the *UN General Assembly Thematic Discussion Group on Conventional Arms Control* argued China believes it is necessary to reach an international legally binding instrument on fully autonomous lethal weapons in order to prevent automated killing by machines. Yet, like any other major power, China does not act enthusiastic with the idea of limiting its margin of manoeuver when it comes to the research, development, and potential deployment of autonomous weapons systems[89].

… Yet with some Critical Limitations

For many years, China has been on the lookout for innovative capabilities aimed at overcoming the *technological catching-up* strategy the nation has long pursued in the field of military and space assets. Beijing is now actively searching for ways to generate a reversal of the global military balance. Yet the question remains to what extent China can succeed in this enterprise.

Even though many examples suggest that China has often been trying to narrowly find inspiration in the American way of military modernisation, emerging concept such as that of *intelligentized warfare* tend to indicate China may also evolve in its effort to adapt its military organisation to the twenty-first century.

[87] (Chen, 2018).
[88] (Kania, 2020).
[89] (Kania, 2020).

Beyond and beneath concepts, however, and despite the country's substantial investments to promoting AI developments, major shortages remain, explaining why China still stands only at the second rank when it comes to research and applications. First, thanks to its unique attractiveness for foreign engineers, the United States still remain by far the world's leader in cutting-edge technology. From about 1.9 million engineers worldwide, one million work and live in America today vs. only 50,000 in China. In the USA alone, some 1,078 AI companies hire 78,700 employees, while China's 592 AI companies hire only 39,200 employees. Another consequence of China's second rank in AI makes it still depends on US technology for a core and critical component in AI technology, i.e. graphical chips. Thus, the vast majority of most advanced AI applications run by leading-edge major Chinese technology firms are powered by foreign chips. Before the outbreak of the US-China so-called trade/technology war, it was believed that China could outcompete the US in advanced AI. Having at its disposal a far much larger data set than its Western competitor does, China could use these resources to train its algorithms and thus forge cutting-edge applications in several fields[90]. However, the country's heavy reliance on foreign sources of AI technology in the graphical chips sector impedes its industry to pursue its progresses at an exponential scale. Now, US technology restrictions are forcing China to strengthen basic and applied AI research to catch up core technologies. Until recently, it was assumed Chinese operators could always purchase necessary chips from Western semiconductor industry leaders. Now, export restrictions appear to have major effects on Chinese AI industry, and the outbreak of the US-China technology war under the Trump administration has exposed how vulnerable China actually is to external constraints regarding the development of its native AI industry. This situation has led the Chinese authorities to encourage and support AI innovation in specialised chips, and some firms such as *Cambricon Technologies* took up the challenge to provide AI national industry with Chinese chips.[91]

Amid some remarkable developments, it must be noted that China is a very latecomer in the field of AI. The country has however pursued a very different approach than the US in this field. China's AI research began in the 1990s, i.e. much later than in the US indeed. Moreover, its AI industry only started to get fully involved over the past few years. From the 2000s, however, both the *Ministry of Science and Technology* and local governments provided sustainable funding that enabled Chinese researchers to attend leading international AI conferences and to publish in high-impact international journals. This strategy proved to be very fruitful. It has considerably increased the role of Chinese AI research representatives in leading conferences and journals, and it cannot be disputed that China's AI research community has become a credible and respected contributor. Yet, the overall picture is far from perfect. Contrary to the US, the nexus between Chinese academic research and industry is still

[90] (Ernst, 2020).
[91] The company's Cambricon-1H and Cambricon-1M chips are already present in most of Chinese consumer's phones. The Cambricon-1A chip is for its part aimed at becoming the first advanced leading edge processor for deep learning systems. See (Trippe, 2020).

very limited. At the one hand, China's innovation policy seems to present a homogenous picture of a top-down, unified approach, largely inspired by a neo-mercantilist state-centric capitalism. As a result, the intertwined nature of private enterprises and the party-state has led to a complex web of overlappingnetworks and relationships between state agencies, state-owned enterprises, financial institutions, investment vehicles, trade associations, etc. On the other hand, like most latecomers, China's innovation system is largely affected by several disconnects between research institutes and the industry. Beyond discourses and CMI concepts, a large gap still exists between civilian industries and defence companies. As already mentioned, China has also to cope with its legacy of Soviet-style planning system, i.e. R&D often remains locked into different layers of state bureaucracy. Finally, yet importantly, despite efforts aimed at opening its market and promoting an indigenous form of capitalism, centralised control has been regaining prevalence in recent years. This is likely to slow down the aimed transition to a more market-oriented approach to innovation policy. Rather, recent policy initiatives emphasise top-down technological choices, relaying on state-run firms and insulating priority sectors from potential rivals.[92]

Conclusion: toward a geostrategic reversal?

For the past two decades or so, China has been engaged in a concerted, comprehensive effort to modernise and upgrade its military. It has dramatically increased its military spending and invested massively in new defence capacities. Backed up by the country's fast-expanding economic cloud and sustained GDP growth, the increasing capabilities of China's defence industry, and the widened strategic choices it allows to shape in return, concurrently reflects the PRC's ambitious objectives of accelerated modernisation as well as its growing global interests. Notwithstanding issues of historical and structural path dependency, as the country becomes more capable and self-reliant, yet also more "assertive", the nature and contours of its global footprint will be increasingly shaped by the ways China's collective leadership chooses to align its strategic goals with technological advancements. (As well as by how, conversely, others respond to those choices). Already, China has acquired, within the embedded dynamics of its economic-technological development, a "*growing capability to shape the direction and future trajectory of the strategic competition*" in the Asia-Pacific and Indian Ocean regions, yet also beyond (i.e. in Central Asia or in Africa) – not only through its accelerated military modernisation, but also through the diffusion of its investments and norms, and perhaps most crucially, the strategic choices they underlie.[93] This includes China's ability to alter strategic alliances and the balance of power in different geographic areas through its growing arms exports, technology transfers, and military cooperation. These developments must also be viewed in the comparative context of other countries' own strategies and military-technological developments.[94]

92 (Brandt & Rawski, 2019).
93 (Raska, China's Defence Strategy and Challenges, 2017, pp. 60-61).
94 (Raska, China's Defence Strategy and Challenges, 2017, p. 60).

In several respects, China has narrowed down the gap with other powers whilst advancing towards some important technological frontiers in recent years. That advancement, however, has been occurring at differing rates, and the "*uneven defence-industrial progress that has resulted from* [this] *means that China is better positioned in some sectors than others*".[95] In a few critical development areas, China has become a near-peer competitor, even eventually holding (or being possibly very close to) a slight technological edge over its American and European benchmarking counterparts[96]. Yet, in many other sectors, it is still lagging far behind. Nevertheless, there is every indication that the capacity development of China's defence-industrial base will continue to progress, as it is regarded as critical to the country's security by the PRC's authorities indeed. Most certainly, China will continue to seek "*niche technological developments* [that] *could potentially revolutionise the PLA's operations by providing* [i.e. vis-à-vis the U.S.] *a credible asymmetrical edge in regional flashpoints in East Asia*".[97] At a more general level, this could be particularly manifest in more recent spheres of warfare, such as cyber and space. These two aspects should be closely monitored as China is rapidly moving forward on its capability development path therein, not the least also as military developments in those spheres come inextricably with significant repercussions at a broader societal level. Whilst the U.S. has led the Internet revolution, China is working hard to reduce its dependence on its servers, chips, and software, and at the same time is rolling out its own "*Digital Silk Road*"[98]. In space, the country now runs its own global navigation satellite network, and competes with the U.S for new technologies like "*intelligentized*" electronics, quantum communication, anti-satellite weapons and space-based missile defence. While the U.S. continues to maintain unparalleled military-technological advantages, it nonetheless finds its (once undisputed) military superiority increasingly questioned by China's advancements in those domains. This creates a set of new critical challenges – in both economic and strategic terms – that are meant to reshape the face of security at the regional (Asian) and international level over the coming decades, as the U.S.-China strategic competition in the making, turned an increasingly conflictual rivalry at once, is now rapidly building up as the overarching divide of this century's geopolitics.

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[95] (Boutin, Defence Technologies and Industrial Base, 2017, p. 42).
[96] (Raska, China's Defence Strategy and Challenges, 2017, p. 55).
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Balancing China's Rise

Why Small European Countries Matter

Jonathan HOLSLAG[1]

Two times in history, Belgium had to reflect about China in military terms. The first time was in the nineteenth century. The Qing Empire had fallen into decay. Japan and European countries deployed troops to back their commercial ventures. So considered also King Leopold I, entertaining as well hopes of securing a part of China's market. In 1859, he proposed to deploy a brigade. *"It is with pleasure that our troops will cooperate in the Chinese expedition and that we will form a well-equipped brigade,"* he wrote, *"But in this constitutional state, such kind of enterprises are generally shroded in difficulties"*.[2] His son, the Duke of Brabant and future King Leopold II, commented: *"If we manage to send 4,500 Belgians to Beijing, we would be stupid not to profit from such a strategic pivot."*[3] Parliament balked. No troops were sent in the end.

The second occasion was the Korean War, between 1950 and 1953. A battalion of Belgian volunteers embarked to support a UN-mandated intervention. Undermanned, the battalion still gained a reputation for its fighting power. It was in the frontline when Chinese troops crossed the Imjin River. *"The Chinese were like wild animals,"* a soldier testified, *"They came suddenly and they disappeared suddenly. Yet, still, the Chinese overwhelmed us."*[4] The Korean War was a milestone in China's history. It showed that, about one hundred years after the mutterings of Leopold II and the European gunboat diplomacy, this *Century of Humiliation* had ended. Even if the newly established PRC remained destitute, it adopted a strategy of active defence against foreign interference.

Today, China emerges a third time as a matter of military concern to Belgium and other European countries. Seventy years after the Korean War, China, thanks to sustained economic growth, seems to have moved from active defence

[1] Thanks to Luk Sanders, Alexander Mattelaer, and Philippe Boucké for reviewing the draft.

[2] *« […] je verrais avec plaisir nos troupes coopérer à l'expédition de la Chine, qu'on pourrait former une brigade qui serait bien composée, mais que, dans un pays constitutionnel, toute entreprise de ce genre était entourée de difficultés. »* (Juste 1879, p. 613).

[3] *« Si nous parvenons à envoyer 4 500 Belges à Pékin, il faudrait être bien maladroit pour ne pas profiter d'un tel pivot stratégique. »* (Duchesne 1963, p. 1059).

[4] (Vandamme 2014).

to quiet offence. At the very least, the difference between defence and offence has become less clear in China's increasingly global military posture. China actively advances its economic interests. This is followed by a gradual build-up of military capabilities to defend these interests overseas. Economic growth also permits China to slowly erode the military advantages of its adversaries in an increasingly large theatre. The historic tide is turning.

European countries remain reluctant to accept that China's economic growth comes with military consequences. This chapter makes the case that a balancing effort is due. Of all the rising powers in the last centuries, China holds the largest potential for gaining dominance over Eurasia. Even if we skate around the discussion about its intentions, the question about whether we can rely on the official Chinese vow not to work towards hegemony, it is imperative to preserve a balance of power. Small contributions matter in that regard. Balancing China needs to be conducted in a measured way. The focus is not on countering China, but bolstering our resilience at home. Balancing China also needs to happen in a way that permits European countries to prioritise security in their neighbourhood.

Rather than detailing military and diplomatic consequences of China's rise, which I do elsewhere[5], the aim of this chapter is to set the scene for a broader strategic debate, and also to seize China's ascent to come to grips with some thorny issues inside our own country and armed forces. It first discusses the options for small countries to respond to rising powers. Second, it examines the repercussions of China's growth, why European countries have been reluctant to balance, and why it is important that even small European countries do balance. Finally, it clarifies how small European countries can work towards measured and comprehensive balancing.

Balancing

The strong do as they can and the weak suffer what they must.[6] The weak therefore have an interest to balance the strong. Like companies require a diverse market to flourish, as opposed to a monopoly situation, and citizens' interests can be better safeguarded in a state with political checks and balances, as opposed to a dictatorship, countries' interests and security are thought to be best preserved if there is no single dominant power.[7] Hence the need to preserve

[5] (Holslag, Trapped Giant 2010) and (Holslag, China's Coming War with Asia 2015).
[6] (Thucydides 1997, p. 32).
[7] A more detailed discussion on this latter point is of course due. My personal view uses to be close to Aristotle's, namely that the virtue in a state is more decisive than the form of the state, but also to Machiavelli's warning that the damage done by a tyrant without virtue is larger than the damage done by a republic without virtue. I must confess that the last decade of Western politics made me somewhat less sure about that latter part, however, I still believe our stunted democracy preferable to authoritarianism.

an international balance of power. It permits smaller countries to shape their external relations and to prevent others from shaping their internal choices, their way of life. Preserving a balance of power is about preserving sovereignty. The logic of balancing is thus straightforward.

Diplomatic practice, however, is less so. History is full of examples of countries failing to balance against rising powers.[8] Several factors account for this situation. The leadership might have a limited time horizon and have no eye for the effect of sustained incremental change.[9] Governments can also have a limited geographic horizon, making them focussed on challenges nearby and blind to the growing influence of distant powers.[10] Economism is a third factor. Adam Smith famously pointed out that a rich neighbour should be seen as a commercial opportunity, but he ignored that those neighbours are states whose wealth gained through commerce often supports military modernisation. Hubris can also play a role.[11] Countries accustomed to wealth and power tend to be slow to realise that the tide turns. Balancing also comes with a negative connotation. It is, often wrongly, seen as a precursor of war, identified with policies of containment, confrontation even, a strategy that closes the door to trade and dialogue.

Hence, the tendency to resort to alternative approaches. Appeasement or accepting the power shift is a first option. Appeasement means surrender, surrendering the options to defend values, interests, and sovereignty. Lesser powers can also bandwagon. That too implies the acceptance of the necessity to work with the rising state to extract economic concessions.[12] They can pass the buck, expecting other protagonists to keep the rising power in check. Diplomatic engagement takes the rising power as a given and seeks to make it benevolent through dialogue, inducement, and rules. Important category to be taken into account for pursuing these alternative approaches: the elites. They can be opportunistic, preferring bandwagoning to extract private gains at the detriment of the country's long-term prosperity. Elites can also be opportunistic in a way that they cling to the privileges of domestic power, but lack the courage and the wit to engage much more formidable external threats. They prefer the frivolity of flawed appeasement, engagement, or bandwagoning to the taxing task of shaping relations with a stronger power.

History teaches that, if countries become dominant, they will use that dominance against lesser powers in unpleasant ways.[13] Dominance breeds arrogance. The shift in the balance of power usually coincides with hardening influence, with

[8] See for instance (Schweller, Unanswered Threats 2010), (Paul, Wirtz and Fortmann 2004), and (Ripsman and Levy 2012).
[9] (Gilpin 1981, pp. 9-106).
[10] (Walt 1985).
[11] (Smith 1992, p. 79).
[12] (Schweller, Bandwagoning for Profit 1994).
[13] See for instance (Waltz 1959) and (Gilpin 1981).

the rising power altering its behaviour from self-restraint and defence while it feels vulnerable, to a posture of assertiveness and forward-leaning pushback when it grows strong, to a posture of offence and intimidation when it attains dominance. The main puzzle in that regard is not so much that a large country pursues growth and influence, but that other countries first refuse to consider the long-term consequences, and panic when they get to see the downside, and are forced either to accept the new domination or to fight it and start a new major power war. Effective balancing, in other words, is not about starting a war, about containment and confrontation, it is about avoiding that the power shift becomes so decisive that confrontation or containment emerges as the only remaining option. Measured balancing is key to avoid that confrontational hard balancing becomes the only option when dominance becomes imminent – when it is too late.

Such balancing is not about singling out the rising power as a threat; it is about preventing it from becoming one. This approach, as we will discuss later, does not preclude economic cooperation. Yet, it does seek to avoid unequal gains and political manipulation of trade. It does not prevent engagement. Yet, it takes a great interest in guaranteeing that engagement and dialogue advance key interests. It does not even stand in the way of military synergy. Yet, it pursues military synergy from a position of strength and tries to prevent becoming dependent on the rising power to critical security interests. It is even not about halting interdependence in a broader sense, but about making sure that dependency remains mutual. As evident as are checks and balances in domestic politics, they are vital in international politics.

Europe's Reluctance to Balance

The first important encounters with China's military modernisation took place around 2008, when the country deployed warships in response to piracy in the Indian Ocean. Before, it already became a significant provider of U.N. peacekeeping forces in Africa. Before, however, some European intelligence services had been looking into the involvement of the PLA in cyberattacks, industrial espionage, space programmes, and exports of advanced missiles to countries like Iran and Syria. Since, China's military power and ambitions became more prominent in policy debates, especially after American President Donald Trump demanded it to be a priority for NATO. Many European countries were somewhat forced to start to look at China from a military viewpoint because of American insistence through NATO, yet remained hesitant and at loggerheads about how to respond.

In mid-2020, the EU High Representative Josep Borrell discarded China as a military issue. *"It has no military ambitions and nor does it use force to participate in military conflicts."*[14] Yet, on the other hand, the commander of the French

[14] (Barigazzi 2020).

armed forces stated that China's ambitions were expansionist and could become aggressive.[15] The French minister of Defence warned that China's military ambitions caused uncertainty about the freedom of navigation as well as the future of French territory and 1.6 million citizens in the Indo-Pacific.[16] The commander of the armed forces of the Netherlands remarked to be in competition, even "*at war*", with China.[17] The commander of the British armed forces referred to China as a challenge. *"We see a more assertive Russian threat and we see the challenge of China very vividly,"* he said, *"Hence, this era of constant competition, and perhaps arguably, constant conflict."*[18]

Behind closed doors, European military officers and diplomats also have diverging opinions. On the one extreme, there is the assertion that China is not a military challenge or threat. On several occasions, in national contexts, as well as in EU and NATO settings, diplomats from large European countries stated that China has no history of aggression and expansion, that it does not seek to upset the global order, that it is too far from Europe to constitute a threat, or that the world has become too interconnected for new great power rivalry. On the other extreme, but significantly less numerous, there are those who believe that China is emerging as a new hegemonic power, that its policies in its neighbourhood, including its claim on Taiwan and adjacent seas, already challenge European interests, and that its construction of bases overseas, like in Djibouti, presages an assertive posture globally.

There is no European vision for China in the making. The most recent European Security Strategy, which dates from 2009, refers to China as a partner and as a country that shares Europe's goals and values.[19] A 2019 European Commission paper refers to China as a systemic rival and states that China's military assertiveness undermines trust and challenges European security.[20] The High Representative himself, however, contradicted these assertions. A new internal reflection process, led by the European External Action Service, is started. Many countries seem to be supportive of adopting a more geopolitical perspective towards China, but it still remains unclear what *geopolitics* entails in this exercise. The US government has only recently proposed NATO's *North Atlantic Council* and the *Political and Security Committee* to resume discussions about China.

The debate about the military consequences of China's rise among European experts also remains less mature than in the United States and Asian countries.[21]

[15] (Lagneau 2018).
[16] (Bourdillon 2019).
[17] (Schat 2020).
[18] (Knowles 2020).
[19] (Council of the EU 2009, 42). Also: (EEAS 2016).
[20] (HR of the EU for Foreign Affairs and Security Policy 2019, pp. 1, 4).
[21] Two dedicated edited volumes with predominantly European contributions: (Kirchner, Christiansen and Dorusse 2016) and (van der Putten and Shulong, China, Europe and International Security: Interests, Roles, and Prospects 2010).

They focussed mainly on economic affairs and issues such as cyber security. European experts contributed insights into specific aspects of military and security issues, such as China's naval deployments, military presence in Africa, arms trade, and cooperation with regard to security issues, like Iran.[22]

Hence, more than ten years after the first important Chinese out-of-area operations, despite a decade of growing Chinese military presence in Europe's neighbourhood, and in spite of the consequences of China's rise for the military orientation of a key ally, the United States, the majority of European countries are still trying to make sense of it.

Eurasian Leviathan

Why should European countries care and why is it necessary to balance? This question could be answered by highlighting the fact that China is an authoritarian state, has recently decided to largely ignore the treaty-bound promise to respect the autonomy of Hong Kong, and incarcerated large numbers of Uyghurs in re-education camps, likely over one million in total. From this viewpoint, it is the nature of the Chinese state that constitutes the largest threat: China is not just a rising power, it is a rising dictatorship that brutally represses dissidents, quietly seeks to expand its territory, and cunningly distorts the global market place. These allegations are not groundless. However, we do not even have to consider the nature of the rising state or discuss whether it is right or wrong, to conclude that its growing power poses a challenge today and might become a security threat in the long run. Let us review some points.

The potential. The last few times that European lesser powers faced the ascent of a new dominant power, it led to dramatic conflict: the Napoleonic Wars, the wars with Germany, and the Cold War. China today has a far larger economic and demographic potential for Eurasian dominance than any rising revisionist power in the last centuries. It has carefully balanced its internal economic capabilities and external behaviour. With about one fourth of Eurasia's population, China today almost represents one third of Eurasia's economic production and military spending.[23] China, so far, is also much more effective in converting its potential into growth and thus to gain power. Its main peer, the United States, still struggles to reinforce the economic fundaments of its power. Japan and Russia are stagnant. Southeast Asia remains divided. Indian economic growth again fell below that of China. India's manufacturing output

[22] (Casarini 2007), (Kamerling and van der Putten 2011), (Duchâtel and Sheldon-Duplaix, The EU and the Modernisation of the PLAN 2011), (van der Putten, China's Evolving Role in Peacekeeping and African Security 2015), (Legarda and Nouwens 2018), (Nouwens 2018), and (Duchâtel, Overseas Military Operations in Belt and Road Countries 2019).
[23] World Bank, World Development Indicators Database. Retrieved from: http://databank.worldbank.org/data/source/world-development-indicators

is already ten times smaller than China's; its official military budget four times. The gap continues to widen. The European Union has lost an important member state and also has difficulties developing a strong common economic and security policy.

The desire. While Chinese leaders have claimed that their country will never seek hegemony, a Chinese society with potentially 1.4 billion rich consumers will make it a hegemony by default if other important regions fail to keep pace.[24] From China's perspective, its core aspirations are just and defensive in nature. They concern the survival of the Party monopoly through sustained economic growth, the consolidation of control over restive frontier lands, including Tibet and Xinjiang, and the incorporation of lost territories – including Taiwan, the China Seas, and contested parts on the Indian border. We can add to this a fourth aspiration, i.e. the redressal of the damage done during the Century of Humiliation and the restoration of China as a strong, respected power.[25] These core aspirations, however, also imply hegemony, as their fulfilment will open the way for China to radiate its influence more widely and will also require it to do so. After all, incorporating lost territory demands China to develop the capacity to subdue smaller neighbouring countries as well as to keep the United States at a distance, hence denying it access to the Western Pacific – and beyond.

The opportunity. Chinese leaders often spoke of the last few decades as a window of opportunity to advance the country's main aspirations. The global economy was open; few countries bothered balancing its growing economic power; resistance was mostly symbolical. Despite the recent confrontational policy of the US government, the protectionist trade policy has been dysfunctional, as China continued to run immense trade surpluses. Possible Eurasian balancers (including Russia), Japan, the *Association for Southeast Asian Nations* (ASEAN), India and the European Union are undecided. Even if China does not have many allies, it can count on a large number of countries that refuse to oppose it. Consider the European member states that decided to become a part of the *Belt and Road Initiative* (BRI), despite concerns at the level of the European institutions. Several put economic cooperation with China upfront. Some, especially small countries close to China, already fear the cost of balancing and conflict. Others, like India and Japan, are reluctant to support US-led hard balancing. Russia, Iran, Pakistan, North Korea, and various other regional powers are even less inclined. Reluctance and fragmentation permits China to continue to grow its power, influence, and presence. All China needs at this point is not so much a large number of allies, but a large number of countries that tolerate unbalanced economic relations, and present to China the consumer markets, the raw materials and the technology to sustain its growth, and at the same time refuse to join American hard balancing.

[24] I developed this point in (Holslag, China's Coming War with Asia 2015).
[25] Xi, Jinping, 2019. Speech on the occasion of the 70th Anniversary of the PRC. Beijing, 30 September 2019.

The reach. If the major powers in the past were held back by formidable geographic limitations, meanwhile, connectivity has transformed the world into an arena of an unprecedented scale. Originally, Chinese empires struggled to project power beyond the Northeast China Plain. Now the Himalaya and the Hindu Kush mountain ranges, as well as the hills of Southeast Asia, have become staging points for Chinese commercial and military activities. What emerges is a diffuse network of onshore trade corridors that stretches from Shanghai to Antwerp. Countries in the heart of Eurasia are slowly incorporated in a sphere of influence, much more than it was ever the case when dynasties tried to control the Silk Road in the past. Checks also vanish in the maritime domain. China now combines the continental thrust described by Halford Mackinder and the maritime thrust highlighted by thinkers such as Alfred Mahan. While Russia already sends large numbers of troops back and forth between the eastern and western ends of Eurasia, Chinese onshore transport infrastructure expands, and Chinese air- and sea-lift capabilities increase, we might realise that distance will be less a constraint. In addition, power can be projected with growing ease, speed, and accuracy, by means of missiles, cyber, and space-based assets.

The vision. China has the vision to further develop its power potential by growing its influence throughout Eurasia and beyond. Even if China is not a monolith and it does not necessarily follow a single grand strategy, it has various official visions for expanding its influence on the Eurasian landmass and around. Like the American President Bill Clinton once said that the United States need to be at the centre of every global network, the Chinese government seeks to build economic networks with China at the centre. Its Belt and Road Initiative is a good example. China also has policy documents that explain its plan to build a network of suppliers of raw materials, to take the lead in exploring the mining potential in the heart of Eurasia, in Africa, as well as on the floor of the Oceans, to support Chinese companies to buy farmland, and to back Chinese oil and mining companies to control important deposits abroad.[26] There are plans to support Chinese firms in weaving Eurasia into a network of high-voltage electricity networks, supplied by Chinese nuclear power plants and renewable energy, into networks of fibre optic cables, mobile phone networks, railway networks, maritime networks, and so forth. These visions of Eurasian economic expansion on China's behalf are explicit. This is less so with regard to military and security ambitions, although the leadership has stated repeatedly that the flag has to follow the trade and that the protection of its economic interests abroad is critical. Hence, the first bases in Djibouti and Tajikistan, interest in other possible hubs such as Gwadar, and the expansion of state-affiliated private security providers.

It hence appears that China is on a typical imperial trajectory. While its leadership is still consolidating state control domestically, at the same time it

[26] Point developed in (Holslag, The Silk Road Trap 2019).

slowly moves on to assert its interests beyond today's accepted borders, and tries to find ways to defend its growing economic interests abroad. Its gains in economic power lead to growing military power. Its gains in power allow it to grow its influence, in various ways from humanitarian aid and incorporation to coercive diplomacy and economic blackmail. While its influence hardens, it displays fragility and strength at the same time. China is an export champion, but its factories struggle with overcapacity. China is an emerging high-tech power, but still many of its investments are unprofitable and its overall productivity remains low. This, too, is not unusual. We can refer, for instance, to the debut of the *open-door policy* of the United States toward Japan, in 1853, just a few years before the American Civil War broke out. We can also refer to Germany's Weltpolitik, amidst internal social and economic volatility. Each such hurdle China manages to overcome, each crisis mastered, allows it to advance further on this tenuous imperial trajectory. At this point, nobody can take Chinese success and dominance as a given. But nobody can exclude it either. China's collapse has been predicted many times in the past decade. Each time, it showed resilience.

Even if we consider China to be on an imperial trajectory and consider its potential for dominance in the long run, two important additional points need to be made. The first addresses the argument, still often heard among European diplomats, which holds that China has a different strategic culture, refrained from expansionism in the past, and rather projects its influence through a Confucianism-based tributary policy. This conception, however, is problematic. China did pursue expansionism and it coincided with brutal conquest.[27] The territory of the PRC today is, in fact, the result of centuries of steady expansionism from a small heartland between the two main rivers in the Northeast China Plain. Tibet and Xinjiang used to be as much *"abroad"* a few centuries ago as, for instance, Northern Africa to imperial France. If European imperialism spread more via the seas, Chinese imperialism spread via valleys and plains. One important difference with Europe is that China preserved and consolidated these conquests more successfully into an imperial structure. The territorial expansion was more lasting. Europe in the past had overseas colonies; Chinese empires incorporated neighbouring territories as provinces. It is also not entirely known how peaceful the famous maritime missions of the Ming admiral Zheng He were. Today, China's blue water capabilities are developing exceptionally fast and so does its maritime mercantile prowess. From a geopolitical viewpoint, China is a hybrid power, and it has gained ground both on the continent and in the seas.

Hence, China's strategic culture is not preprogrammed by history or geography to be peaceful or less expansionistic. There is a second widely held argument that needs to be considered, namely that the nature of international politics has changed. Interdependence and the threat of mutual destruction make the

[27] Point developed in (Holslag, A Political History of the World 2018).

use of military power less rewarding. The threat of annihilation, however, has never been a guaranteed protection against aggression since armed conflicts often also escalate unintentionally. There is no evidence either that economic interdependence has neutralised possible causes of armed conflicts that might involve China. If anything, decades of interdependence and globalisation have allowed China to accelerate its military modernisation, and to assert its claims much more forcefully. Moreover, if the major powers accepted and encouraged interdependence in the past, they have started to try to reduce their dependence on each other. Interdependence is not a given. Economic growth and trade, as China has much confirmed in the last few years, can propel military expansion. Hence, whatever our appreciation about the current state of China, its political system, the commercial exchanges, and so forth, we do need to consider the prospect of a new Eurasian leviathan. The Chinese economy has slowed down, but even if we make an extrapolation of the last ten years of slowing economic growth, China is still set to surpass the United States as the largest economy in the next ten years. Its share of Eurasia's total economic output could climb up to 37% in 2030, 44% in 2040, and 50% in 2050.[28] No Chinese imperial dynasty has ever commanded such economic advantage. The Qing Empire, at its peak, commanded around 36% of the wealth of Eurasia; the Ming Empire around 30%. Chinese Eurasian dominance is no certainty. China might pace ahead, it might stumble; it might collapse. Nobody knows. However, we cannot exclude it.[29] The intentions of a dominant China cannot be predicted. Most of the time, it was stated before, dominance leads to arrogance. We do not have solid evidence that China will be an exception to that rule.

Putting our house in order

These forces look formidable and are difficult to grasp. If matters such as 5G or China's naval shipbuilding programme remained somewhat tangible, this power shift is the deep incremental change that accounts for some of the recent turbulence on the surface. From the viewpoint of a small European power, it appears even more surreal to try to respond to it, even to consider that it might balance. Yet, even if China would command 50% of the Eurasian economy and, hence, obtains immense leverage to shape its partnerships and financial resources to spend on its military, it still leaves a significant combined potential for other countries. What then does balancing imply for small European countries and more particularly to their armed forces?

It is tempting to answer that question by putting the focus instantly on specific military matters, such as China's military presence in Africa, cyber security, and so forth. Yet, balancing is not a purely military operational matter. One cannot

[28] Calculations based on the current GDP between 2010 and 2019 in the World Bank's World Development Indicators database. (https://databank.worldbank.org/source/world-development-indicators).
[29] Calculations based on the historical GDP for 1800 and 1600 in (Maddison 2014).

expect armed forces to rise to the challenge, if the rest of the country does not understand what is at stake. One cannot expect armed forces to bolster their capability, if the overall power of the country declines. One cannot preserve security around a society that is not ready to defend itself. Hence, before we can proceed to the hard, outer layer of military balancing, we do need to consider the mellow fabric of a nation's morals and politics. We need an approach inside out and it could consist of several important layers.

First, we need to have a clear understanding about what balancing means. As stated previously, the essence of balancing for a country is to preserve its own power, not necessarily to undermine the power of others. The best way to preserve international checks and balances is to grow stronger together. China's rise has become a pressing problem, because many other parts of the world, especially the West, have settled in their stagnation. China is a wake-up call to do better. Power combined with wisdom and virtue is the best form of security. It is vital to safeguard sovereignty, the country's capacity to make independent choices, and to prevent to have to obey to the choices of others. Balancing is both internal, strengthening the capabilities of the country, and external, working more efficiently with other countries. Hence, the essence of balancing is to maintain the power that is needed to build our own future. The armed forces should make this point more forcefully and skilfully, towards the society at large, but also towards specific stakeholders, like companies. True entrepreneurship is about harnessing creativity, wit, and factors of production to contribute to the long-term prosperity of a society.

Second, the capacity of shaping our own future is about preserving the liberty and sovereignty of our children. In that regard, it is crucial for the armed forces to explain much better what is at stake. The armed forces need to remind its soldiers and society at large more compellingly what they defend. Soldiers must be professionals, but they need to be patriots first. They need to understand what it means to live as a small country under the domination of others. They need to understand the consequences of oppression. We cannot allow men and women in uniform to degrade into technocrats with a gun. The armed forces must again make a much larger effort in this regard to inject historic knowledge in each part of its formation, to make young recruits understand what they defend, and to make each soldier an information warrior that has the knowledge and skill to explain this to relatives, friends, and colleagues. Commemorations of the World Wars, monuments, and so forth need more care. We need soldiers to take this message much more powerfully to schools, to news media. In order to recognise the challenges posed by others, we need to know how we are first.

Third, soldiers need to be prepared for a difficult time. Most men and women in uniform already experience these times as difficult, given the high workload, limited resources, and limited recognition. As our country's political complexity paved the way for the weakening of our economy, and given the fact that it is not evident for a society that got used to its wealth and peace to see the threats, this is unlikely to change soon. This is the most difficult fight imaginable,

to preserve security in a society that is unwilling to make sacrifices. Yet, the leadership must lead by example, show courage, dedication, and vigour in turning that tide, be ready to make personal sacrifices. If it cannot hold to men and women in uniform the promise of recognition, it can promise to them the resolve to fight for it. Fighting spirit abroad requires fighting spirit at home first. We cannot remain quiet.

Fourth, we need an integral view of national security. Military power is built on and requires synergy with other assets, including a solid national economy, good education, internal security, effective governance, and so forth. The armed forces cannot do their job if weakness is allowed to take hold in other parts of the society. The armed forces must work more closely with other stakeholders, including corporate leaders, civil society, and other government departments, to continuously assess the challenges to our national security. It needs to communicate its assessment in a balanced and bold way to the society, enhance its domestic authority as a security provider, and advise the political leadership more convincingly. It should no longer let its security assessments be determined by politicians. The political leadership has the constitutional right to make final decisions, but the armed forces have the constitutional duty to guard national security and, hence, to communicate in plain terms about it, directly to citizens. If politicians do not follow an assessment, and take different decisions, it is up to them to explain that.

Fifth, an integral view of national security and proper communication demands a much more professional capacity to fuse intelligence, operational insights, inputs from other stakeholders and strategic foresight into powerful stratcom products, policy options and operational choices. The armed forces need to better cultivate complementarity and synergy with other stakeholders, including diplomacy, think tanks and universities. There needs to be a more demanding culture of excellence, out-of-the-box thinking, reviewing, and challenging inside and in between relevant departments of the armed forces. There needs to be a much better capacity also to translate information into stratcom products that resonate in the entire society. Quality needs to be rewarded more and the end-users need to be given the opportunity to evaluate quality. There needs to be a key responsible in the command chain to oversee and catalyse this process of fusion and quality improvement. If we want to stand a chance earning the domestic support to respond to challenges abroad, we need to convince with the quality of our knowledge, the persuasiveness of our policy advice, and the effectiveness and lethality of our deployments.

Rising to the challenge

The precondition for any balancing effort is to get one's own house in order. Only then can we consider responding properly to the rise of China. This brings us to a sixth priority: we need better and comprehensive situational awareness. We need to understand the rise of China in all its aspects. Each country has its

own perspective on China. We must work with them, in bilateral partnerships, inside NATO and the EU, but we must also preserve the independent capacity to understand what China's rise is about. We need to communicate proactively about it, confidentially with specific stakeholders if it must, publically whenever we can.

Seventh, it is important that the armed forces help to check that bilateral relations with China are balanced. Once more, balancing does not exclude cooperation and dialogue. Yet, balancing does require cooperation to be level, to be reciprocal. The armed forces intelligence service needs to be better equipped to address eventual challenges to national security that are related to industrial espionage in sensitive sectors, espionage against – national and international – governmental institutions, eventual dependency on goods and services key for national safety, technology transfers in military or dual-use, and so forth. Too often, we remain blind to the state of our exchanges with China. The intelligence services also need more capacities to counter state-guided efforts to influence our domestic debate about China, being it through information campaigns, – implicit and explicit – economic coercion, as well as incorporation. The military intelligence service requires more qualified and specialised civilian collaborators, as well as more demanding quality review processes that allow it to develop high-end intelligence products to that purpose. We live in an era of hybrid and grey-zone war: this should be a part of our response. Finally, the armed forces do have an interest in overall balanced economic relations. Like the Chinese government, and increasingly various Western governments, we need to understand the effect of economic security on military security.

Eight, we need to engage more actively in China-related debates with international partners, including inside NATO and the EU. Awareness of the challenge of the power shift is growing, but this needs to be encouraged. Coordination in international organisations is vital, but coordination also demands individual countries to do their bit. There can be no strong multilateral alliances without strong national contributions.

Ninth, even with an eye on China, we need to put Europe's neighbourhood first. The worst possible evolution would be a rising China, with European countries vacating more of their backyard. It will cause a power vacuum that China, and others, will fill. That brings a responsibility to do more in the south. Africa and the Middle East sliding deeper into turmoil will be a pretext for various powers to intervene, and in the long run increase their presence – in support of their own economic interests and as a source of leverage regarding Europe. As China seeks to develop the capacity to deny access to adjacent seas, European countries should work together to retain dominance near the gateways to Europe. Our navy should deploy more frequently near Bab el-Mandeb, in the Eastern Mediterranean, and the Central part of the Atlantic. We need to keep an eye on the Levant (and Iraq in particular), an important geopolitical crossroad between Europe and Asia, and the main continental gateway to the Mediterranean. We need to work with other government departments to concentrate efforts more effectively on certain countries in Europe's southern neighbourhood.

Tenth, a response to Russia's *anti-access and area denial* (A2AD). Russia has shown us a glimpse of a new wave of warfighting: an intimidating amalgamation of grey-zone campaigns and highly lethal, cost-efficient armed force. Russia's military build-up and capacity to deny access to its neighbourhood is a modest prologue of the new contest for military dominance. Russian military modernisation is the appetizer to the Chinese main course. It is essential to help preserve the balance of power with Russia, yet also to look towards the eastern theatre to test and enhance our warfighting capabilities – across the full spectrum. We can think in this regard of counter-intelligence, countering disinformation, electronic warfare, advanced mine countermeasures, SOF deep infiltration, standoff warfare, and trans-regional mechanised mobility. As long as we cannot get to grips with the Russian military build-up, we do not stand a chance against China's military build-up.

Finally, we must understand and explain the importance of the fourth wave of warfighting. Countries risk to fall completely behind in terms of innovation in military technology – such as hypersonics – and operational concepts – such as dispersed high-intensity campaigns. Too often, we are into the dark about developments in cyberwarfare, electronic warfare, and the rapidly modernising capabilities for nuclear warfare and missile defence. A collective European effort to catch up is overdue, but this also entails that we need the capacity to contribute. The Belgian armed forces already contribute to initiatives like the *Defence, Industry, and Research Strategy* (DIRS). Yet, it is advised to establish a task force to encourage synergy between armed forces, R&D and companies in this endeavour. It needs to explore in which niches our country can contribute, but also to explain the fourth wave of warfighting to the public and political leaders.

Conclusion

This chapter has made the case for small European countries to rise to the China challenge and to be ready for a measured, yet comprehensive balancing effort. Even if we sidestep the debate about whether or not China's regime and ambitions are problematic, the very magnitude of the power shift and its potential for Eurasian dominance should prompt small European states to take it much more seriously. China transforming into a Eurasian leviathan will constitute a security threat as much as all other domineering Eurasian powers did in the past. It will come at the detriment of our country's freedom of action and the ability to shape its future.

Military balancing is essential and our own armed forces need to do their bit. Yet, it is a precondition that some internal constraints are tackled first. Before we can make an earnest attempt to balance militarily, the armed forces have to make a greater effort to understand the nature of the challenge, to explain that the defence of the sovereignty of our children and grandchildren will demand sacrifices, and to clarify with much more authority and courage the stakes

to citizens and specific stakeholders. China's rise is not just an issue that the military has to deal with in practical terms; it is one of the formidable forces that might shape the lives of the next generations of citizens of this country.

Only if these internal requirements are met, the armed forces might consider to make a small difference in light of the formidable power shift. In any such effort, security needs to be defined broadly. The armed forces need to enhance the capacity to work with other departments and to gather intelligence about the broadening relations between China and our country. Multilateral coordination is a must, but even then, the size of individual contributions matter. In the first place, we need to approach China's military modernisation through our neighbourhood, make sure to avoid the growth of power vacuums, enhance presence along key gateways to Europe, and more earnestly respond to Russia's military capabilities to deny access or to exploit the grey zone below the threshold of war. Balancing Russia is a warmup to balance China. Lastly, we need serious thinking about the fourth wave of warfighting and avoid at any expense that we end up in a similar situation as the decaying Qing Dynasty at the time of Leopold II, that is, weak and defenceless, partially because it failed to see how the world around was changing.

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Who says *power shift* says positioning of China and positioning towards China. What attitude should we adopt with respect to this economic adversary with considerable growth objectives and ever-increasing leadership aspirations? How should we deal with a trading partner that is continuously challenging our key values and core political and security interests?
This publication tries to provide some answers to these questions and will hopefully enrich our mutual understanding of the *power shift* trend.

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ISSN: 2295-0923