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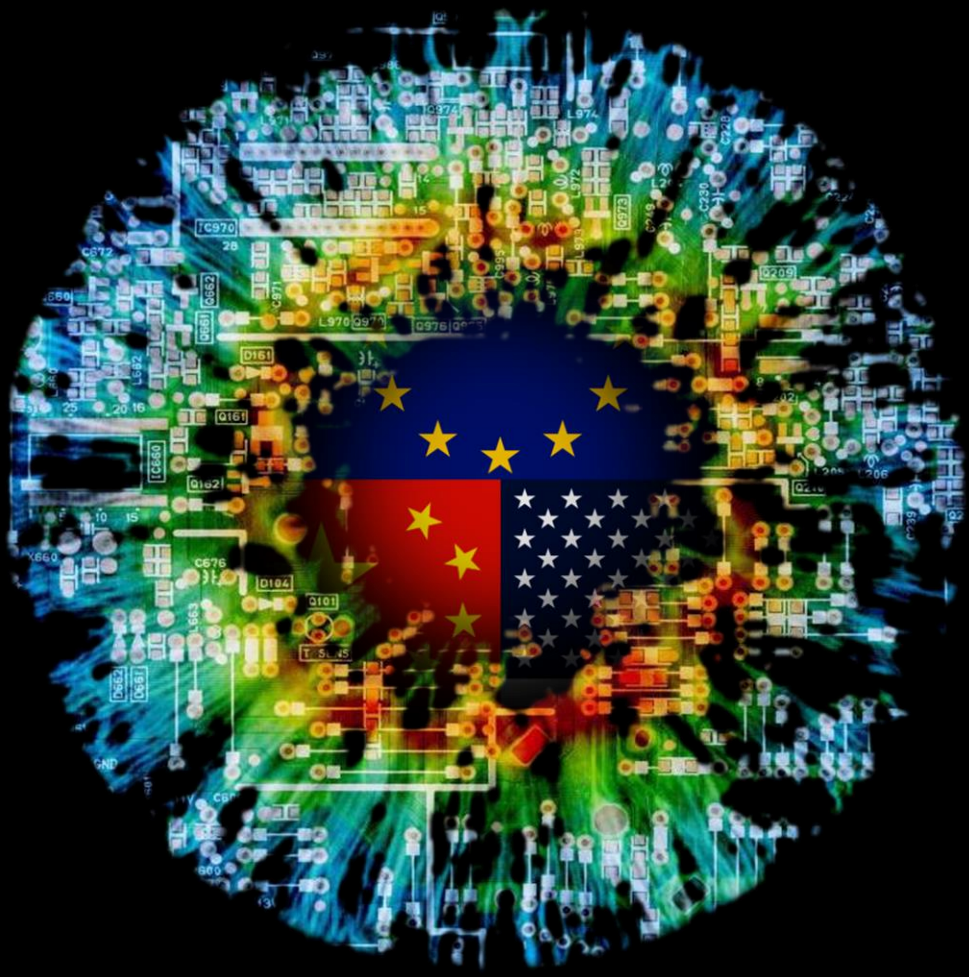


Towards a tech-driven Cold War

NEW YORK	MILAN	LONDON
45, Rockefeller Plaza *Suite 2000* *New York, NY 10111* *USA*	*Piazza Castello, 26* *20121 (MI)* *Milano* *IT*	*Berkeley Square House* *Berkeley Square* *London W1J 6BD* *UK*

Executive summary

There might, hypothetically, be a clear winner of the "**Fourth Industrial Revolution**". **AI systems** and **5G technology** are surely the revolution's **two key enablers,** and the **first mover - the first to successfully implement these systems on a large and sophisticated scale - will certainly gain a competitive advantage over others**. This is **not, however, a winner-take-all game**. There is rather a potentially virtuous cycle, whereby technologies attract the talent and capital which, in turn, stimulates innovation further by utilizing the enormous amount of data generated by this technological-industrial revolution.

Nevertheless, states and private-sector participants should also **start thinking about which directions we collectively wish to take these new technologies**. Most companies and governments are now in the process of setting up their AI and 5G technologies; given all the blurriness surrounding this topic, **we believe it would be best to pause for a moment, to first understand what we are aiming for and why.**

Sooner or later, 5G and AI will deeply affect our lives, influencing sectors such as fintech, health care, manufacturing and even agriculture. Thus, **5G security** and **AI ethics should always be on governments' to-do lists.** Political leaders sometimes seem to forget that. A few positive steps have been taken regarding this issue, including a pledge not to develop lethal autonomous weapons by DeepMind founders, Skype founder Jaan Tallinn, Elon Musk and some of the world's most respected and prominent AI researchers. This is particularly relevant in a world that is becoming increasingly polarised by a Cold War between the US and China, whose technological rivalry is a key (if not the key) component of their broader political rivalry.

We believe that technological supremacy will be achieved by countries that are able not only to devote the largest amount of investment to areas such as AI and 5G, but rather are also able to provide a combination of **vision**, **strategy**, **resources**, **ethics** and **real applications,** where emerging technologies are concerned.

Currently, the **quality of engineers** and the **ability to attract quality employees** are, along with competitive **open markets** and a **strong influence on allies,** the key advantages of the **US** in this race. On the other hand, **China** is ahead in the game, **given its authoritarian state**, **huge domestic market, reduced privacy concerns** and **head-start in 5G**. In spite of this, the **United States will definitely not sit back and watch the Chinese continue to pull ahead**.

In this contest Europe appears behind, out of the ring so to speak. **Holding back on its quality research and internal states' divergence**. It is time for the Old Continent to shake up and create a clear common strategy.

Yet, **this is and will continue to be one of the toughest technological fights ever**.

Disruptive technological innovation

Disruptive technological innovation is radically changing production in both the manufacturing and service sectors. We have new technologies in the energy, biological, manufacturing, financial, information, agricultural and defence sectors. **Robotics and automation**, together with **Artificial Intelligence** ("AI"), **Big Data** ("BD") and the **Internet of Things** ("IoT") **will revolutionize the way we work**, **live**, **entertain** and **interact**. But while technological innovation comes with the hope of higher productivity (which is not appearing yet in the macro data; this is itself a puzzle), it is also disrupting jobs, firms and entire sectors. This disruptive innovation is capital-intensive, skills-biased and labour-saving especially for low value-added blue collar and now even white-collar jobs. As such, it is becoming a cause of even **larger inequality**, which, in turn, has led to a severe populist backlash against economic élites. Large parts of populations that are being left behind are now voting for populist leaders and parties that are opposed to globalization, trade, migration, supranational institutions, liberal democracy, and even disruptive technologies themselves. This is a trend that will take time to reverse.

A new Cold War is emerging

New geopolitical risks are emerging: the period in which the US was the only global hegemonic power, for a decade or so following the collapse of the Soviet Union, is coming to an end. We live now in a world of traditional powers (US, Europe), emerging new powers (China, India) and some revisionist powers (Russia, Iran) that are challenging the international economic and security order that was designed by the West after WWII. Among all these new powers the strongest is **China**, which **is on pace to become the largest economy in the world and challenge the US not only in the economic**, **financial**, **and commercial realms** but also in the **military**, **security** and **geopolitical ones**. Scholars and analysts are already predicting that this rivalry between the US and China will be the key geopolitical issue of our time, and will lead to a Cold War (if not, perhaps, eventually a hot war) between these two global powers.

Harvard scholar Graham Allison has written the book "*Destined for War: Can America and China Avoid the Thucydides Trap?"*. In the book, **Allison shows that in 12 out 16 historical cases when a rising power has faced an existing power, war has eventually ensued as a result.** The rising rivalry between the US and China has military and security dimensions but also economic, trading, investment, financial and technological ones. To focus on its main aspects, we can distinguish between three legs of this emerging Cold War between the US and China: a **trade war**, a **technological war** and **disruption in global supply chains**.

THE VISIBLE CONFLICT: TRADE WAR

The most visible **conflict** between the US and China **is over trade**. At the onset of this conflict, the US imposed tariffs of 25% on $250 billion of Chinese imports, based on allegations of a wide range of unfair Chinese trade practices. China retaliated against these US tariffs with its own tariffs on more than $110 billion of US imports. In the last couple of weeks, the US has threatened to increase its tariffs to 25% on all goods imported from China by July 2019, and China has retaliated by imposing more tariffs on $60bn of goods imported from the US. **The looming trade**

war between the US and China has **led to negotiations** that are expected to result, at some point, **in an agreement** that should **prevent** a further escalation of the **trade war**. But given the recent escalation of trade tensions between the US and China, the probability that a trade deal will not be reached has increased significantly in recent weeks. While the baseline expectation in these negotiations may still be a trade deal, for now both sides look like they are on a collision course with one another.

If and when this agreement is reached, the terms of a **possible trade deal** between the US and China could include the following: China's commitment to purchase an additional $1.2 trillion of US goods over the next six years; a reduction by China of tariffs on a wide range of imported goods; a significant reduction of non-tariff barriers to trade; the opening up of a variety of sectors to foreign FDI, starting with financial services and other service sectors; stronger enforcement of intellectual property rights; the loosening of the requirement that joint ventures with Chinese firms by foreign investors must be majority-controlled by the Chinese partners; restrictions to "forced" technology transfers in such joint ventures; the opening up of government procurement processes; a mechanism for mutual enforcement of the trade agreement; agreement on currency stabilization and a more transparent process for monitoring foreign exchange reserves; some access to cloud computing services in China for foreign firms; and an trade negotiation enforcement mechanism that will bypass the WTO process.

Some of the goals of the agreement seem to be too ambitious, but it is clear that the US side sees the $200 billion a year figure as aspirational: so long as progress is achieved on all the various chapters of the agreement, undershooting that $200 billion target even by a large amount would be acceptable to the US side. There is also **the risk** that while a trade agreement is reached, in a few months **the US may complain that China is not adhering to what was agreed to, or is not implementing the agreement quickly enough**. After all, 2020 will be a presidential election year, when trade policy posturing may increase. Thus, aspects of the agreement may unravel over time and lead the US to reimpose tariffs on some Chinese goods. Indeed, **most of the elements of the trade agreement are not black and white issues,** but rather will be measured in various shades of grey. For example, what does it mean that China enacts a more robust IPR enforcement mechanism, or does not force technology transfers? How might one measure the progress on such contentious and complex issues? These are hard judgement calls; progress in each chapter of the agreement will be tentative and gradual.

THE "INVISIBLE" CONFLICT: TECH WAR

While a possible trade deal in the coming months could allow a further escalation of a trade war to be avoided in the short run, **the strategic rivalry between the US and China** on geopolitical, economic and technological matters will **remain over the next few years and decades.**

Underlying this new Cold War is a technological contest in which the US is aiming to prevent China from achieving the goals of its **"Made in China 2025" agenda, a plan designed to make China the dominant economy within what may be the ten most technologically relevant industries of the future (robotics, aerospace, AI, driverless cars, biotech, etc.).**

China has already leapfrogged traditional financial services, such as brick and mortar bank branches and credit cards, to create online payment systems such as Alipay and WeChatPay, which are used by almost every Chinese. China may be the first country where cash will disappear – even its few beggars accept donations using Alipay or WeChatPay – and it is more advanced than any other country in the world in the adoption of fin-tech applications, payment systems, credit allocation, and insurance. Eventually it may become more advanced in asset management as well. **China is way ahead of the US in fin-tech services**, as well as in facial

recognition technologies and their applications. It is also making **major strides in the development of autonomous cars and trucks, without having to worry (as the US does) that a few fatal accidents** - like those experienced by Tesla or Uber - would sharply slow down and delay the development of driverless vehicles.

The *Made in China 2025* is a strategic goal that China will not give up easily

China sees itself as being on the verge of technological advancement that **will change its economic structure** from low value-added manufacturing to high value-added and high-tech manufacturing and services**. The US is strategically committed to prevent China from achieving leadership in the technologies and industries of the future**. The battleground between these two countries is mostly over technology and foreign direct investment (FDIs). The **first line of the US attack** will be to **prevent China from "stealing" technology** in strategic industries. This means that Chinese FDI in key strategic industries in the US will be severely restricted.

Examples of how the US is effectively blocking the acquisition of US companies by Chinese companies – through a novel use of the Committee on Foreign Investment in the United States (CFIUS) process – are the Qualcomm/Broadcom and MoneyGram/Ant Financial cases, and the potential sale of the US semiconductors producer Lattice Semiconductor to Canyon Bridge Partners. **The US is also considering invoking the rarely used International Emergency Economic Powers Act, to issue an executive order to scrutinize or stop informal and formal partnerships between the US and Chinese firms in the fields of AI**, semiconductors and autonomous vehicles.

Indeed, key US technology companies, such as AMD, IBM, Nvidia, and Qualcomm, have operations in China that include research labs and training initiatives, in collaboration with Chinese businesses and institutions.

LONG-TERM RISKS: **A POLARISED DE-GLOBALIZED WORLD AND THE BALKANISATION OF GLOBAL SUPPLY CHAINS**

The third leg of this new Cold War is the **increasing polarisation of the world** and balkanisation of existing global supply chains. For a number of years, **China has restricted or banned key US internet giants** - Google, Facebook, Twitter, Amazon, etc. – **from doing business in China. At the same time, it has cultivated its own national champions, such as Alibaba, Baidu and Tencent**. However, these Chinese firms are not formally restricted from doing business in the US, even if their activities in the US have so far been very limited. The US could decide to use a principle of "reciprocity" – as has been threatened by President Trump - to prevent Chinese internet giants from doing business in the US, if US internet giants are forbidden from doing business in China.

A recent example of the technology war is the **US threatening to ban Chinese telecom firm ZTE from using US components for seven years** after it was accused of violating US sanctions against Iran. This sort of "extra-territoriality" has been used in the past, to force foreign financial institutions that do business in the US and use dollar funding to abide by US financial sanctions against Iran and Russia or else face financial sanctions. But the ZTE action is a much broader "extraterritorial" decision to prevent a foreign firm from using US components when it has allegedly violated US sanctions against third countries. The **US is now investigating whether Huawei**, a much bigger telecom giant than ZTE, **also violated US sanctions against Iran**. A decision to sanction Huawei in the same way as ZTE would be a major shock to the global telecom industry, given that Huawei is a leading firm. Since 2012 Huawei has already been facing a de-facto ban on selling its network equipment to US operators, due to security concerns that the US government has expressed. Huawei's attempts to do deals with AT&T and Verizon, to provide its smartphones to the US market, have also been dropped because of political pressure

on those US telecom giants. The formal ban recently introduced by the US administration has further complicated the situation.

More broadly, the **US is aggressively pressuring its allies to avoid using Huawei's 5G technology**. It has dropped the country-by-country waivers it had previously provided regarding sanctions against Iran, in ways that put China in a difficult position in terms of its energy policy and oil imports from Iran. The US Justice Department recently indicted two Chinese citizens for the alleged theft of General Electric's trade secrets. Now the US is cracking down so forcefully on Chinese acquisitions of US tech and other firms (using the new Foreign Investment Risk Review Modernization Act legislation, FIRRMA, that gives new powers to CIFIUS to block foreign deals into the US) that the flow of such deals has collapsed in the last 12 months.

Countries may soon be encouraged to source their supplied from either the US or China, not from both of them. Many countries and regions will be caught in the middle of this strategic rivalry, asked to pick a side when they want to have good economic and foreign relations with both powers. The recent case of the resignation of the UK Defence Minister, for having allegedly leaked the outcome of a National Security Council on the adoption of Huawei technology, shows **how politically sensitive this issue has become. Some US allies, such as Germany and most of the EU, Japan, South Korea, and Australia, already trade more with China than the US**. However, because they are military allies of the US, they also feel pressure not to join the BRI or use 5G technologies designed by Huawei. **The success of the BRI may gradually put the entire Eurasian landmass under the economic influence of China, at a time when most of Europe is still a US ally within NATO**. The economic influence of China is expanding from Asia to Central Asia, Europe, the Middle East, Africa and even Latin America.

In all of these regions, traditional friends and allies of the US are starting to engage more trade, investment and technological deals with China. In Asia, the ASEAN countries and the countries that negotiated TPP liked the "pivot" of the Obama administration to Asia, as they expected to have strong economic, trading and investment relations with both the US and China. **But the first action of Trump when elected president was to withdraw from the TPP, an own-goal that will gradually put many of these countries within the economic and trading sphere of influence of China**. Indeed, China has a broad plan of using economic statecraft to increase its economic and geopolitical influence in Asia and in other parts of the world. This plan includes the BRI, the AIIB, the BRICs Bank and the RCEP trade project, among others.

As a result, one of the implications of the polarization of the world is the potential for a balkanization of global supply chains. After the ZTE case, China will certainly plan to domestically source semi-conductors and other key tech industrial inputs. China may decide to reduce its critical vulnerabilities given its dependence on semi-conductors imported from the US, by reshoring the production of critical production inputs. The new form of extra-territoriality of sanctions mentioned above will certainly lead China to try to stop relying on U.S. chips in its tech firms' production of many goods. While this goal may take many years to achieve, **as China is still behind the US in critical advanced semi-conductors' technologies**, the urgency of achieving production autarky of these sensitive and strategic inputs is now clear to China. To be sure, the **first salvo of this war is the Chinese decision to investigate the top three global semiconductor producers** – two of them Korean and the other American (namely, Micron) – for price fixing, i.e. cartel behaviour.

In a world that may gradually become de-globalized or "slowbalized", or fragmented by and between the US and China, other regions and countries which aspire to have good relations with both super-powers will feel the tensions from the mounting Cold War between them. Other countries will increasingly be asked to pick a side, when they would rather peacefully engage with both.

Broad agreement or temporary truce?

Given that the **Cold War** between the US and China is taking place **on so many fronts**, the question emerging at the moment is the following: would a trade deal between the US and China be a **comprehensive agreement**, or would **it merely be a temporary truce in their underlying conflict?**

Certainly, any trade **deal will not include matters that are at the core of the economic model of China**.

Reform and restructuring of the SOEs will not be in the agreement. The wide range of de facto economic and credit subsidies that China provides to its firms will not be dealt with. While **China** will publicly tone down its "Made In China 2025" plan to achieve dominance in ten new industries of the future, **it will continue to pursue that plan more quietly**. Its goal to achieve dominance of AI by 2030 will remain in place. The BRI goals will continue, if tempered by concerns about avoiding excessive debt build-up by recipient countries. And rise of cyber warfare will remain largely unchecked even if China might commit – as it has in the past – to limiting its trade cyber-theft actions.

So it is quite likely that, as during the Cold War between the US and the Soviet Union, there will be no comprehensive compromise, rather only a series of "truces" that will allow the two contenders to gather their energies for a subsequent fight.

During the first Cold War between the US and the Soviet Union, the world was divided into two geo-strategic blocs, but these two blocs were involved in very little trade and investment with one another.

After the fall of the Iron Curtain, we had over two decades of globalization when China, India and former Iron Curtain countries joined the Western global liberal economic order. But **with the looming Cold War II between US and China we risk returning to a two-bloc world in which, unlike during the first Cold War, a massive reversal of the previous integration in trade, investment, global supply chains, technology and data transfers would take place.**

This potential balkanization of the world economy would of course have highly significant economic, financial and geopolitical implications.

Like Cold War I, Cold War II is likely to be won by the richer, faster-growing, and larger economy. Only this time, that economy might not be the US.

The fight for AI supremacy

During the Second World War, the British scientist Alan Turing cracked the German "Enigma" with the Bombe machine - a primitive machine learning concept - opening the doors to Artificial Intelligence ("AI"). **Nowadays**, the UK, along with the rest of **the Old Continent, is no longer at the centre of this technological battlefield**. Instead, the **US and China are fighting between themselves for AI supremacy.**

As mentioned in the previous section, **geopolitical tension has grown exponentially around the world** in the last few years. This has created a new, unsettling geopolitical scenario. As in the Cold War, we cannot any longer assume that states and institutions are working toward the world's greater good. This has created **new risks** and **uncertainties,** which have led to economic disruption, political pressures and military tensions. These conditions have created a "doom loop" where leaders are trying to carefully manage international relations while preserving countries' domestic interest.

The intensification of these events **affects all sectors,** and in particular technology. As a matter effect, **AI** is definitely contributing to the increase of rivalries, as it **is driving countries to race out ahead of the rest of the world**.

In history, **all technological changes allowed the first movers to gain a strong competitive advantage**. We have many examples: from the roads and aqueducts for the Romans to the Industrial Revolution for the UK or the Railroad for the US. Thus, pioneering **Artificial Intelligence** is seen as **the way to gain economic, social** or **military advantage over other countries**.

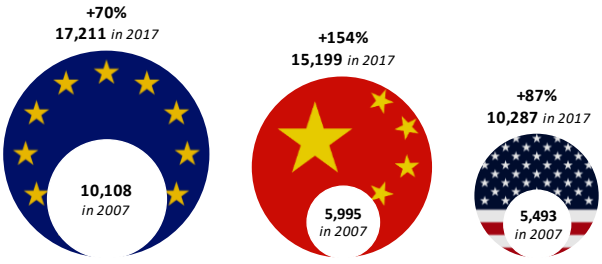
The **fight for AI supremacy** has **already started**. **Countries should be aware of it**

In 2017, **China** set a new target for AI by publishing the **NGAID** ("Next Generation Artificial Intelligence Development Plan"). The objective is to **become the world leader** in artificial intelligence, with a domestic AI industry worth $150 billion **by 2030**.

This plan was published just a year after the **US** released the "**National AI Research and Development Plan,**" with the ultimate intention of providing a range of positive benefits to society from AI, while minimizing AI's negative impacts.

In order not to be left behind, in December 2018 the European Commission decided to take action and put forward a **coordinated EU approach** for **AI "made in Europe"**. The commission objective is to **strengthen AI** research centres across Europe, support the development of an "AI-on-demand-platform" (AI4EU project) and support the development of AI applications in key sectors. To do that, the commission **increased the annual investments in AI by 70%** via the "Horizon 2020" programme, reaching EUR 1.5 Billion in the period 2018-2020. However, the EU still lacks a true and clear common vision as exists in China or the US.

The question that comes first into mind is:
"will it be too late for the EU?"



2007-2017 AI research papers growth

The US share of public cloud storage will decline precipitously

51% in 2017

31% in 2025

China's share will more than double

6% in 2017

13% in 2025

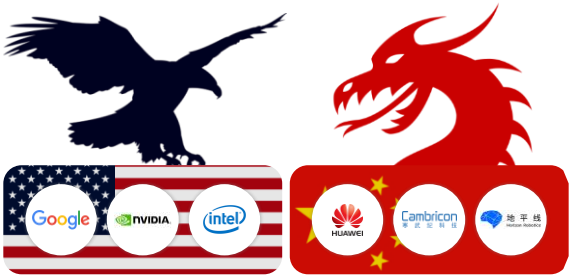
If we look at the research papers in Artificial Intelligence, Europe seems to be leading. But if we look at the growth in 2007-2017, we see that **China was definitely ahead in this game**, with a growth rate double that of the United States and Europe.

European researches seem to be responding to the AI challenge, but there are **doubts over how** this research is being **translated into innovation projects** and **applied research.**

In fact, if we look at the most vital resource for AI - **data** - we see that Europe falls behind. Homogeneous markets such **US** and **China have an excess of data,** which translates in better services, more users, more profits and more resources to further develop their AI systems. In this respect even **the US exhibits a less digitalised market compared to China,** which has 802 million internet users - more than the US and India combined. It is estimated that Chinese internet companies have access to 10 to 15 times more data than US companies.

It seems that the easiest **solution** to tackle the issue of smaller data availability is to look into **what can be done with a "smaller amount of data."** This might even become an advantage as soon as AI becomes more complex.

The answer to these problems would also bring a great advantage **regarding computing power**. Both **US** and **Chinese** big tech companies are building their **own specialized AI chips** in order to address computation-power barriers in big-data. The **US** is currently **leading** in this area with companies such as Nvidia or Intel. **China** is quickly **looking to address these weaknesses** through domestic innovation, acquisition or in some case even "theft" of intellectual property.



Main AI-chip manufactures

If we bring our attention back to Europe, we can see that the answer to Europe's problems appears straightforward. In the 1980s, the Old Continent felt under a similar economic threat by Japan. European countries grouped together to create a wireless standard (2G) and dominated areas of the tech-world with companies like Nokia.

AI is definitely more complex than setting a technology standard like 2G. Still it seems that the **EU's only viable option** to gain an advantage **is to overcome individual states' division**. However, EU member states do not particularly seem to be going in the direction of integrating their AI efforts.

EU's greatest opportunity may be in the regulatory arena rather than technological

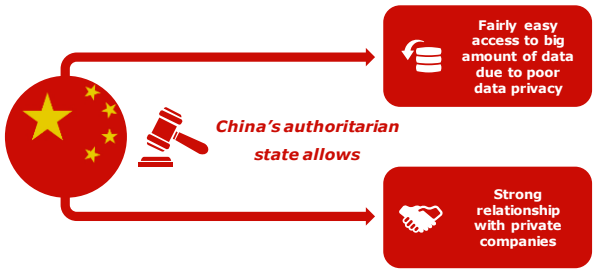
We have learned that AI will eventually affect all economies, but **some countries will gain more than others**, both in absolute and relative terms. We believe that **China** and the **US** will most likely be the two nations to fight to be the first in this technological race.

US firms in this space, from Google to Facebook, Amazon, Microsoft, IBM and many others, **have been technological pioneers** in the AI/Machine Learning/Deep Learning science and initial applications sphere. These companies are still actively and rapidly innovating. But **Chinese firms in this space**, starting with the tech giants Alibaba, Baidu and Tencent, **are rapidly advancing**.

These **two countries started the fight in 2016** when AlphaGo AI-SW of DeepMind (a Google company specializing in AI) won a five-match Go-game against the world champion Mr Lee Sedol. In his book Kai-Fu Lee writes a perfect paragraph about this episode: "If AlphaGo was China's Sputnik moment, the government's AI plan was like President John F. Kennedy's landmark speech calling for America to land a man on the moon".

From that moment onward, China has been doing all the best it can in order to win the AI race.

China's main advantage arises from its authoritarian state



China's main advantage

All abundant **data** that China's tech-giants acquire can be **accessed** by the **government** for reasons of **public or national security**. Whereas in a more democratic setting, as in the US or in Europe, governments do not have the power to do so. In addition, China has looser regulations on privacy laws and restriction on data distribution and usage than the US or Europe (with its recently-approved GDPR directive) do.

This **disregard for privacy** has meant, for example, that **facial recognition technologies** and apps are already **more advanced in China than the US** and are widely used for public security and mass control by police and security apparatus. The lack of privacy also means that the **new "social credit rating" system of China can be used to provide a wide range of new financial services** to all Chinese, even as it is being used for the political control of the masses.

In addition, in **China** the **relationship between private tech-giants** and the **state** is particularly **strong,** compared to the US and EU. Think about China's surveillance programme that was just rolled out with the cooperation of the major private companies such as Watrix or Alibaba. In contrast, in the US employees put pressure on Google, Amazon, and Microsoft not to sell facial recognition software to the US government.

China has also established an "**AI national team**", with Baidu, Alibaba, Tencent ("BAT") and iFlytek. This is analogous to what happened during the Cold War, when the US government asked private companies such as Lockheed, Northrop, and Raytheon to constantly innovate, which was considered a crucial element of national security. This would be almost unimaginable nowadays.

"Keep your friends close, and your enemies closer"

The Trump's administration seems to be going in the opposite direction, by **trying to isolate China**. To begin with, the administration initiated an investigation into China's trade practices and declared that there has been theft of US technology via cyberspace.

The result has been an **escalating trade war,** with the US introducing tariffs on Chinese goods and new investment, and putting in place export **restrictions on key technologies** including **AI**.

This is the tip of the iceberg, **a small part of the much bigger picture discussed in the first chapter of this report**. In fact, early this year China publicly accused the US of trying to suppress its tech companies. As Putin argued, it may be that the nation that leads in AI "will be the ruler of the world".

AI vs. HI: A short history

1994

Chinook - defeated the second best rated player Lafferty at English draughts

1997

IBM's Deep Blue supercomputer - defeated the world chess champion Garry Kasparov in six-game chess matches

2011

IBM's Watson supercomputing system - beat the two best human players of the TV game show Jeopardy

2015

Google's DeepMind - beat nearly 50 Atari games

2015

MIT's Data Science Machine – defeated 615 out of 906 human teams in three data science competitions designed to see which would be best at finding patterns in data

2015

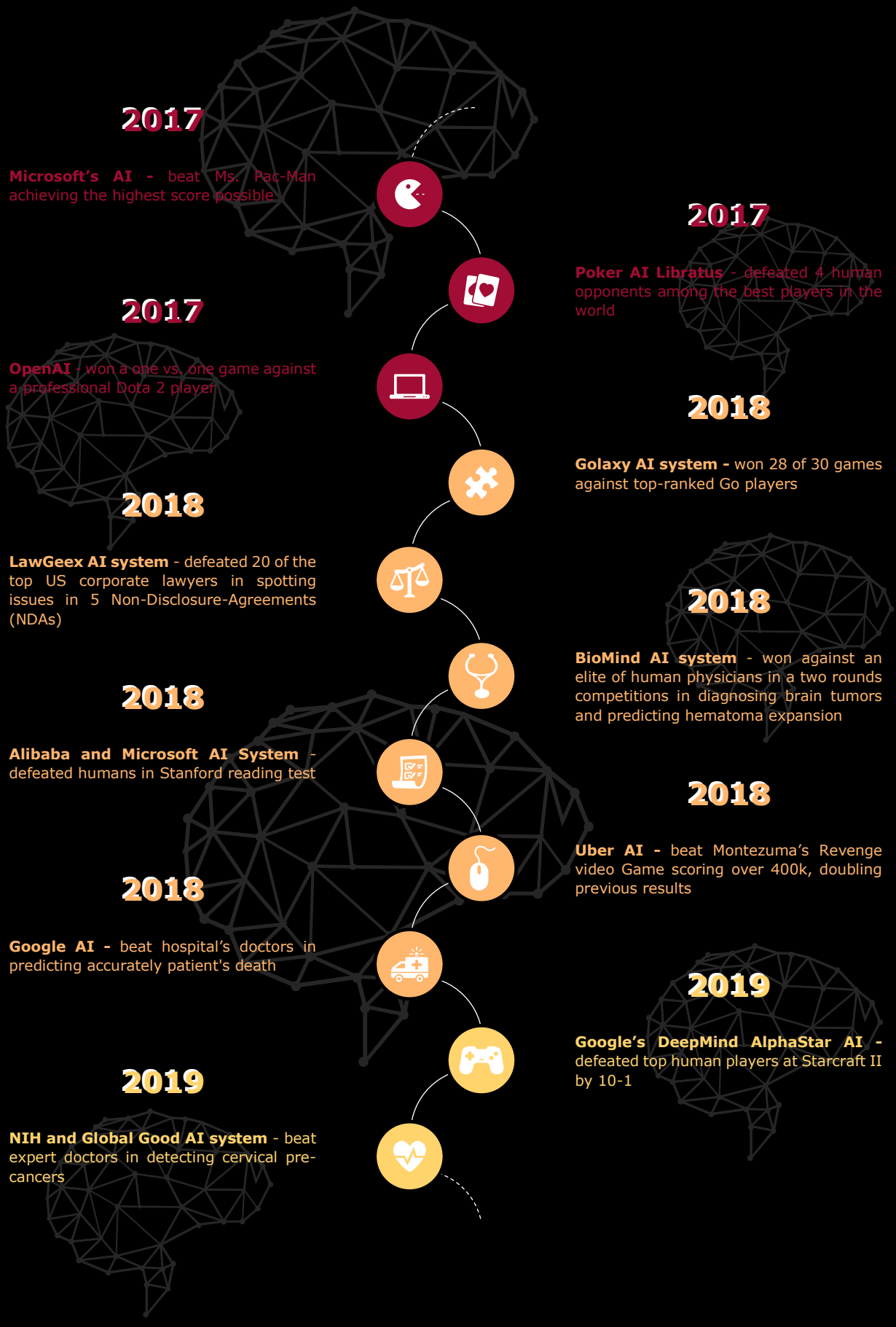
Google's DeepMind AlphaGo - defeated 3-time European Go champion Fan Hui by 5 to 0 at the ancient Chinese game Go

2016

ALPHA AI system - defeated one of the US Air Force's top tactical experts on a flight combat

2016

Google's DeepMind AlphaGo - beat the world champion Lee Sedol by 4 to 1 at the ancient Chinese game Go



2017

Microsoft's AI - beat Ms. Pac-Man achieving the highest score possible

2017

Poker AI Libratus - defeated 4 human opponents among the best players in the world

2017

OpenAI - won a one vs. one game against a professional Dota 2 player

2018

Golaxy AI system - won 28 of 30 games against top-ranked Go players

2018

LawGeex AI system - defeated 20 of the top US corporate lawyers in spotting issues in 5 Non-Disclosure-Agreements (NDAs)

2018

BioMind AI system - won against an elite of human physicians in a two rounds competitions in diagnosing brain tumors and predicting hematoma expansion

2018

Alibaba and Microsoft AI System - defeated humans in Stanford reading test

2018

Uber AI - beat Montezuma's Revenge video Game scoring over 400k, doubling previous results

2018

Google AI - beat hospital's doctors in predicting accurately patient's death

2019

Google's DeepMind AlphaStar AI - defeated top human players at Starcraft II by 10-1

2019

NIH and Global Good AI system - beat expert doctors in detecting cervical pre-cancers

The 5G battle

In this context, **5G** is unquestionably **one key enabler** of the new tech revolution (the "Fourth Industrial Revolution"). The United States government under President Donald Trump seems to acknowledge that. Last year, for example, the US **blocked a $142 Bn hostile takeover of Qualcomm** by Broadcom, a Singapore rival, due to national-security **fears over Chinese leadership in 5G**.

WHY IS 5G TECHNOLOGY SO IMPORTANT?

5G technology will **allow** ultra-fast, low latency and high-throughput communications. It will be, in effect, the **fuel of future smart cities** and **digital economies**. The new IoT apps, driverless cars and any other large-scale apps will be able to properly function, since **5G will** not only **govern** handset voice and data communications, but also **machine-to-machine** communications.

Thus, **5G is a true game changer**, a winning card for the first mover. As discussed in the first part of this report, 5G has the power to **redefine the geopolitical landscape**. 5G could radically disrupt the US and China bilateral relationship as we know it today.

5G will rely deeply on artificial intelligence. In fact, to properly govern and guarantee that specific applications are allocated to the correct network, 5G will make extensive use of AI in order to manage network complexity.

5G is a double-edged sword which puts cyberthreats on the table

5G technology presents true national security issues. Besides non-trivial technical security challenges for the infrastructure and software, there are also crucial structural security concerns, given the number of connected devices and the amount of collected data, which is set to increase exponentially. Cities, industries and even countries will rely more and more on this abundance of data, **increasing the potential for disruptive cyber-attacks to occur**. This will make companies, and consequently economies, **more vulnerable**.

In the real world, **cybersecurity concerns are already present.** For example, last year the **Trump's** administration **accused China** of wide scale cyber-espionage and cyber-theft. The United States said that there is a significant risk – e.g. a leak of sensitive information - when utilizing China's 5G network infrastructure, given the fact that there is a tight connection between China's government and private companies such as Huawei.

However, by adopting a typical tactic of "containment", it seems that the **United States is looking more to buy as much time as possible to create a valid alternative to China's 5G tech lead**.

In fact, China supports low frequencies for core communications and high frequencies as supplemental, while the **US favours the opposite approach**. In spite of this, setting the 5G standard is crucial, since it will not only define how 5G networks are built but also **where the money will flow** among the 5G participants.

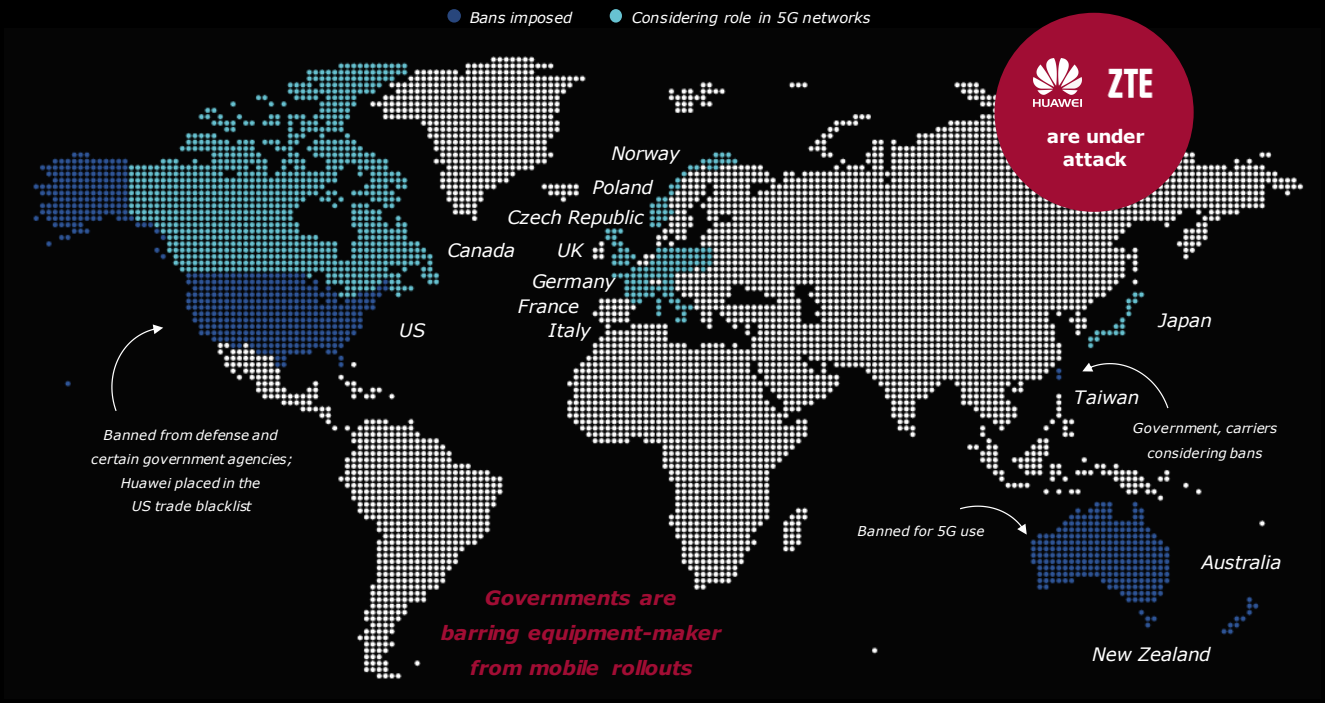
This arm-wrestling among the first and the second world's economic powers is also affecting other countries. The "**Five Eyes**" - Australia, Canada, New Zealand, UK and US who closely cooperate on intelligence issues - **are all acting in order to ban, to a certain extent, Huawei and ZTE products**.

Even in **Europe** there has been a rise in **concern over this issue.** Some countries, such as Germany, are considering the same measures against Huawei's 5G, which might cause a ripple effect.

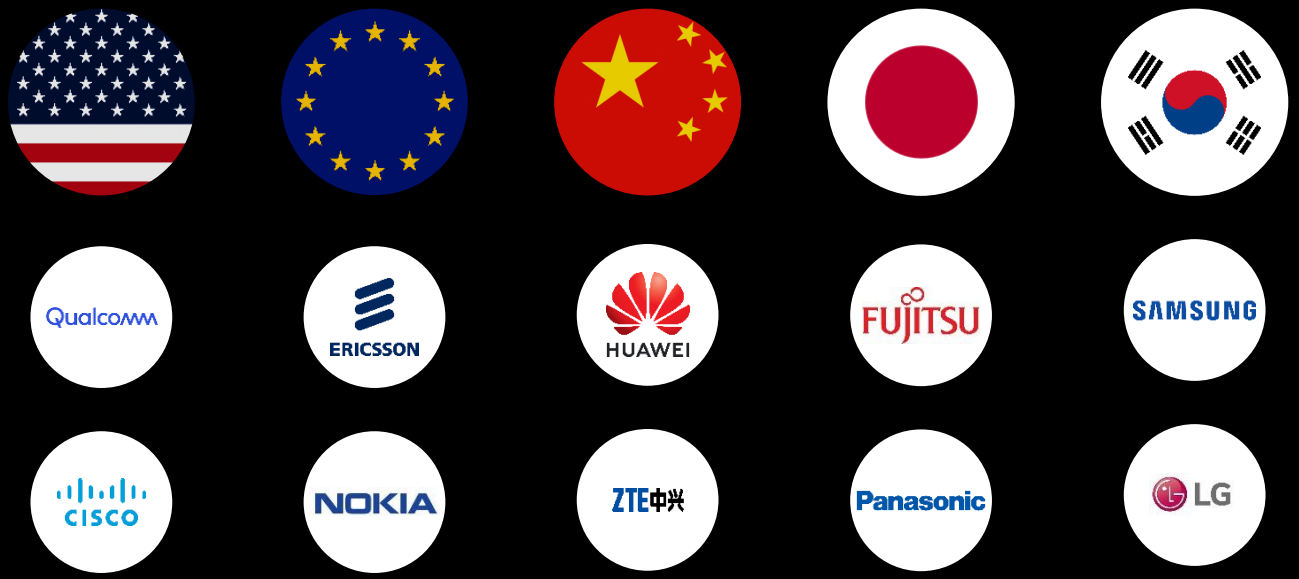
A bilateral 5G ecosystem would force both developing and emerging markets to make tough choices. A number of African countries, along with other governments more sensitive to costs, will probably choose to go with the Chinese equipment, but it is likely that the US and its allies will strongly pressure them not to proceed, in order not to depend on China for 5G over time.

However, it seems that **5G technical issues** or **security concerns** do not truly represent the real problem. The two super-powers just want to be sure that they will be in the best position **to lead the technological revolution**.

WORLDWIDE TENSIONS OVER CHINESE TECHNOLOGY



MAIN 5G COMPETITORS BY COUNTRY



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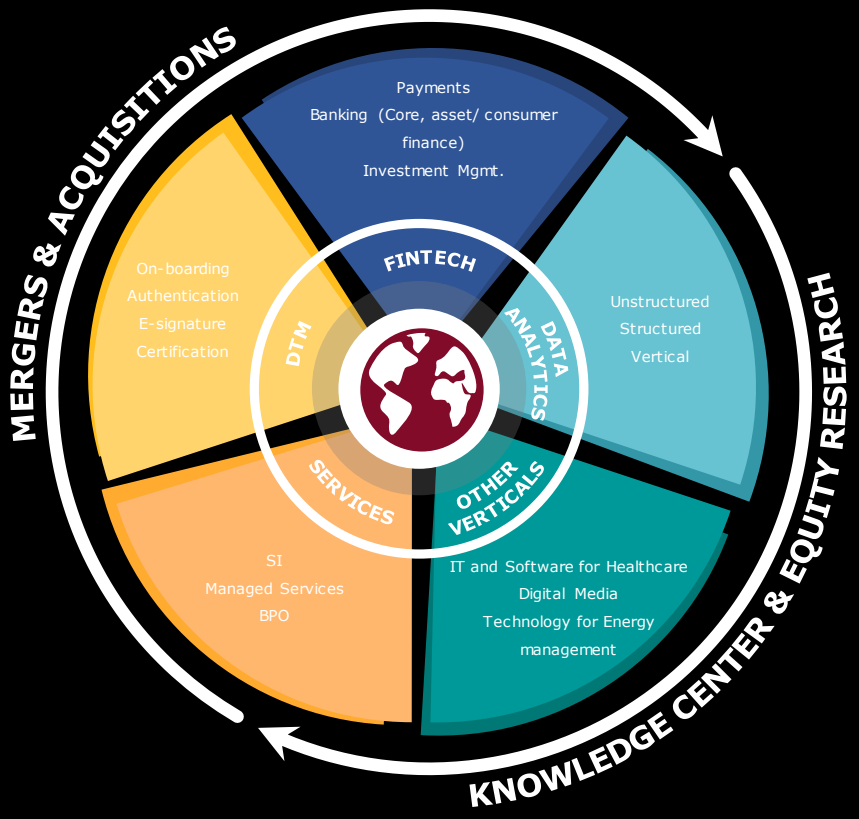

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