Article

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The Chip War and The Need for a Strong State

The semiconductor shortage was caused by supply chain problems and led to major losses across industries during COVID. The fear that this will happen again, along with a desire to remain a leader in technological innovation, has led to some major political choices in the USA. These choices have had an impact on the rest of the world, and have also triggered a response from China- apparently locking the two countries in a Chip War.

The China – USA war isn't that simple

Its "imperative that semiconductor technology remains a central feature of American ingenuity and a driver of our economic growth. We cannot afford to cede our leadership." She identified China as the central challenge, condemning "unfair trade practices and massive, non-market-based state intervention" and cited "new attempts by China to acquire companies and technology based on their government's interest—not commercial objectives," Commerce Secretary Penny Pritzker, 2016

We all remember the trade war that broke out between the USA and China, during the Trump era, with Huawei at the center. But what we didn't necessarily realize was the role that the semi-conductor played in this 'war.'

"Huawei's fight was over semiconductors…. Huawei has mastered the latest generation of equipment to send calls and data via cell networks, called 5G. Yet 5G isn't really about phones—it's about the future of computing, and therefore, it's about semiconductors." (Source: Chip War by Chris Miller)

But what the trade war did was give us an insight into how interdependent the two countries are- an interdependence which is partly because of how central semi-conductors are for the development of all electronic goods and technological – including military ones.

China, with its focus on the development of electronic goods, is a crucial market for semi-conductor firms – including US ones- either because these firms sold directly to Chinese customers or because their chips were assembled into smartphones or computers in China. And China is heavily reliant on the chips produced and designed by firms – including the US ones. Even Huawei uses Taiwanese chips, though it does develop the main processor chip itself.

"The Chinese market was so enticing that companies found it nearly impossible to avoid transferring technology. Some companies were even induced to transfer control of their entire China subsidiaries. In 2018, Arm, the British company that designs the chip architecture, spun out its China division, selling 51 percent of Arm China to a group of investors, while retaining the other 49 percent itself. Two years earlier, Arm had been purchased by Softbank, a Japanese company that has invested billions in Chinese tech startups. Softbank was therefore dependent on favorable Chinese regulatory treatment for the success of its investments." (Source: Chip War by Chris Miller)

The problem is that while China is heavily reliant on chip manufacturers, they are working to develop their own semi-conductor industry - investing billions in the industry year after year, as well as in other technologies such as artificial intelligence. This led to the USA worrying that it will lose its technological edge – an edge has always been crucial to its position as the global hegemon. Especially as industry experts believe that China has the technical know-how to produce advanced chips though it lacks the commercial ability to scale up production.

So now, America is working to slow China's progress down while developing its own technological advantage

In order to slow China's progress, the USA began to throttle Chinese access to the computer chips or semiconductors needed for the most advanced artificial intelligence models. President Joe Biden also signed an executive order that authorized the Ministry of Treasury to restrict some investments in Chinese entities in 2023.

"This order will be applied at the beginning of 2024 and will focus on three sectors: semiconductors, microelectronics, and big data technology. Furthermore, based on the American rhetoric, this measure will prevent the American technological experience from being stolen by China, which the Chinese are willing to have to reach the American level in technological

development. Besides that, it will achieve the American goal of stopping the development of Chinese military capabilities, which threaten the national security of the U.S."

The administration has also announced the CHIPS Act, which sparked large investments in the USA's semiconductor sector. Under the terms of CHIPS Act, chipmakers who are awarded funding are restricted from expanding their facilities in China and other "countries of concern" for ten years. This Act was also followed by a mix of sanctions and control instruments to defend U.S. intellectual property and national security and make it harder for Beijing to obtain or produce advanced chips. These include exports of equipment for producing chips at miniaturization levels at or below 14/16 nanometers.

But their concern goes beyond China

"*DARPA and the U.S. government have found it harder than ever to shape the future of the chip industry. DARPA's budget is a couple billion dollars per year, less than the R&D budgets of most of the industry's biggest firms. Of course, DARPA spends a lot more on far-out research ideas, whereas companies like Intel and Qualcomm spend most of their money on projects that are only a couple years from fruition. However, the U.S. government in general buys a smaller share of the world's chips than ever before…. As a buyer of chips, Apple CEO Tim Cook has more influence on the industry than any Pentagon official today."* (Source: Chip War by Chris Miller)

As a firmly capitalist country, the USA was concerned with finding ways of cutting costs while increasing their profits. This was largely because the chips were developed by private companies, albeit with government support and contracts.

At first this wasn't an issue, the USA maintained its technological advantage by focusing its expertise on chip design even as they outsourced the manufacturing to cut costs. The two main companies who could manufacture the most cutting edge processors were TSMC and Samsung- and while the location of both companies were concerning, the USA were able to maintain their control of, and ensure that they had an alliance with, both of them.

But their concern that they were losing their technological edge became palpable in the final days of the Obama administration and it was carried on by the Trump Administration. Trump's Administration believed that the revolving door between the Commerce Department and law firms who worked for the chip industry and lobbied against export controls. And that this door led to regulations which weakened America's position relative to China as technology leaked from one to the other.

With this in mind, the administration took steps to strengthen USA's positon. One of these steps involved using their confidence in Japanese support to take a tougher stance against China, and effectively destroying their most advanced DRAM firm, Jinhua, in the process.

But the actual issue is that, after decades of offshoring, far less of the semiconductor production process takes place in the United States than before. This has put them at a disadvantage.

The share of modern semiconductor manufacturing capacity located in the U.S. has eroded from 37% in 1990 to around 12% today, mostly because other countries' governments have invested ambitiously in chip manufacturing incentives and the U.S. government has not. Meanwhile, federal investments in chip research have held flat as a share of GDP, while other countries have significantly ramped up research investments.

So, now Taiwan produces more than 60 percent of the world's supply of semiconductors and more than 90 percent of the most advanced chips. While the United States does not produce any higher-end chips today. This makes TSMC, and Taiwan, crucial to American policy.

But they are working to change this, initiating policies and legislations that aim to develop their own domestic manufacturing capabilities.

"The Joe Biden administration says that those and other investments put the United States on track to meet the near-term goal of manufacturing 20 percent of the world's most advanced chips by the end of the decade."

Intel is expected to spend roughly $25 billion this year and $21.5 billion next year on its foundries in hopes that becoming a domestic manufacturer. While this is done with the aim of convincing US chipmakers to onshore their production (rather than relying on Taiwan

Semiconductor Manufacturing Company (TSMC) and Samsung Intel currently uses TSMC for some of its high-end PC processors)!

What's also interesting is that TMSC is currently working with America to support the development of three fabrication plants in Arizona. The company will receive $6.6 billion in grants and $5 billion in loans but it plans to invest $65 billion in the United States - marking the largest foreign direct investment in a greenfield project in U.S. history.

Despite all of this, the USA is still vulnerable

While the USA is trying to develop their local semiconductor industry, they will still be reliant on the rest of the international system. To date, despite consistent efforts, no government has been able to achieve true self-sufficiency in semiconductor manufacturing process.

They are aware of this – which is why they are investing time and energy in helping allies like Saudi Arabia to develop their semiconductor and tech industry. The USA is doing this with the desire to grow a healthy and resilient semiconductor ecosystem, which will help to fortify their own position along the supply chain.

This is not a new policy – it's an old one, which dates back to the cold war and explains how they were able to establish themselves as a Global Hegemon in such a tightly intertwined international system.

The US State Department has partnerships with five countries — Costa Rica, Panama, Vietnam, Indonesia, and the Philippines — to explore semiconductor industry growth opportunities, as a precursor for ITSI funding. Other countries that are being considered include for such partnerships include Mexico, Malaysia and India.

There is also a deal in which the Belgian company 'Umicore' has partnered with Democratic Republic of Congo company 'Gecamines' to recover germanium, a rare metal used in semiconductor manufacturing and some high-tech military gear. The deal falls under the banner of the Minerals Security Partnership (MSP), a collaboration of 14 countries and the European Union – but it is chaired by the USA.

In Malaysia, American chip giant Intel in December 2021 said it will invest more than $7 billion to build a chip packaging and testing factory in Malaysia., GlobalFoundries, another U.S. chip giant, opened a hub in the country to "support global manufacturing operations" alongside its plants in Singapore, the U.S. and Europe.

These are just a few of the examples. But they show how the ecosystem is essential to their policy – and it's not something that they can escape.

This is where their vulnerability lies – not only does it mean that they are not self-sufficient, it means that they need constant access to a global supply chain. This supply chain took a hit during COVID, and led to a knock-on effect on an array of major industries. But the chipmakers are also highly vulnerable to the conflicts, droughts, and logistical debacles that can obstruct waterways and sabotage international trade.

The semiconductor industry relies on "on sprawling supply chains and the steady flow of material, components, and equipment across multiple continents, prolonged disruptions to crucial maritime passages can hike up costs and negatively impact production…. And despite the sheer breadth of this web of waterways, the maritime shipping industry is heavily dependent on a handful of critical passages strategically positioned across the globe." (Source)

If this vulnerability was exploited, the entire Western system would take a hit.

The Chip War shows us that there is a need for a strong state

What's very interesting is the role that the semi-conductors played during the Cold War. It's rarely discussed, with the focus being on nuclear weapons and the space race. Even though the policies and decisions that were made at that time set the stage for the semi-conductors 'chip war' that we see today.

During this time, the USA was able to establish itself as a leader in the semiconductor industry – setting the rules for it and by extension, the rest of technology.

"Every country's electronics industry was increasingly oriented toward Silicon Valley, which so totally set the standard and pace of innovation that the rest of the world had no choice but to follow—even America's adversaries." (Source: Chip War by Chris Miller)

The reason that they were able to do so was the lack of competition from both the USSR and China – the only two ideological competitors of the USA at the time. This was largely a consequence of state policy. While the USA made a concentrated effort to advance semi-conductor technology, Chinese and Soviet government policy held them back.

In the case of China, Mao's choice to plunge China into a Cultural Revolution, straight after the country developed its first integrated circuit, halted any advances that it's scientists could have made.

He believed that "expertise was a source of privilege that undermined socialist equality" and sent "thousands of scientists and experts to work as farmers in destitute villages. Many others were simply killed." Under his "Brilliant Directive issued on July 21, 1968", the country would use poorly educated employees to build advanced industries, as it was it is essential to shorten the length of schooling, revolutionize education…. Students should be selected from among workers and peasants with practical experience, and they should return to production after a few years' study.

He was against foreign technology and ideas. At times, he worried that "all electronic goods were intrinsically anti-socialist", with his supporters arguing that "it was absurd to see electronics as the future, when it was obvious that only the iron and steel industry should play a leading role in building a socialist utopia in China."

By the 1960s, he had "won the political struggle over the Chinese semiconductor industry, downplaying its importance and cutting its ties with foreign technology." (Source: Chip War by Chris Miller)

After his death, China focused on developing electronic goods – "becoming the world 's workshop" by the 1990s. While they knew that they needed to make the "components that powered electronics, like semiconductors", Maos cultural revolution led to them lagging behind Taiwan, South Korea and the United States.

In the case of the USSR, the bureaucrats like Alexander Shokin, who was in charge of Soviet microelectronics, understood the need for the country to develop their semi-conductor technology. But his choices and methods for doing so were fundamentally flawed with Shokin adopting a "copy it" strategy. The strategy may have worked for nuclear weapons, but not for chips which advanced too quickly and required both advanced machinery and expertise for them to function reliably.

"The Soviet Union churned out coal and steel in vast quantities but lagged in nearly every type of advanced manufacturing. The USSR excelled in quantity but not in quality or purity, both of which were crucial to high-volume chipmaking." (Source: Chip War by Chris Miller)

The USA and its allies also took steps to stop the USSSR from acquiring the advanced technology that they needed, including semiconductor components. And while the communist country could bypass the restrictions using companies in Austria or Switzerland, the pathway was hard to use on a large-scale basis. As a result, of all of this, the Soviets had to use materials that lacked the purity that was needed for chips, and equipment that wasn't sophisticated enough – making it difficult for them to produce working chips.

With both of these examples, we can see the importance of state policy for technological advancement and innovation. Both China and the USSR had the scientists to potentially advance their semi-conductor technology, but the lack of support from their respective states kept them behind.

This changed when Chinese President Xi Jinping focused the country on rapid technology innovation – his plan is for China to achieve global leadership in science and innovation by 2050. This threat led to a response from the USA, who redirected their attention and resources to the semiconductor industry, and began to make a clear attempt to bring the tech companies back into the country.

But what the Muslim world needs is the Islamic State

The only way to change the status quo, and ensure that the Muslims are at the forefront of the technological advancements, is to re-establish the Islamic State. This won't only unite the Muslim lands, along with their considerable material and non-material resources, it'll ensure that the

resources are focused on the technological innovation that is required to withstand western pressure and interference.

We cannot study the current situation and say that it's impossible for the Islamic State to develop their own technology and become a leader in the semi-conductor industry. To do so, would be to greatly undermine the strength that will come with Muslim unity. It also forces us to apply Capitalist ideas and experiences onto the Islamic State- while we will learn from the mistakes that both the USA and China are making, the overall systems and policies of the Islamic State are so vastly different that a direct comparison of the two doesn't make sense.

The USA and China are vulnerable because of how their industries and economies are interlinked – the Islamic State will not, or rather cannot, have such a reliance on foreign powers. This is the problem that the Muslim lands have today. Countries like Oman, Malaysia and Saudi Arabia are developing aspects of their semi-conductor industries but those developments are heavily reliant on foreign funds and private company's expertise.

None of this will be allowed under the Islamic State. We will have to have our own currency, which is tied to gold and silver, and must be independent of all foreign currencies.

We are also forbidden to use foreign funds for *"Development and investment." It is also prohibited to grant franchises to foreigners."* Article 165 of the Draft Constitution

When the Islamic State returns, we will focus on uniting the Muslim World, together all of whom will have the resources that are necessary to develop the technology and to ensure that we are self-reliant. In cases where we make political deals with foreign states, it will only be allowed on the condition that the states are not given power and influence over us. And that the terms of the deal benefit us.

What's more is that the technological progress will not be an afterthought. This is an essential aspect of technological advancements – there needs to be a targeted effort towards achieving them. In fact, in Islam, it is not only essential for us to develop our technology – it's a Fard (obligation) - and as such, state policy will be geared towards supporting manufacturing and innovation in the industry.

"All individual subjects of the State have the right to establish scientific research laboratories connected to life issues, and the State must also establish such laboratories." Article 162 of the Draft Constitution

"…. Similarly, whether the factories are of the public property type or they are included in the private property and have a relationship to the military industry. All types of factories must be established upon the basis of military policy… it is a duty upon the State to manufacture weapons by itself and it is not allowed to depend upon other states, because this allows other states to control it, it's will, its weapons and its fighting... This can't be achieved unless the State possesses heavy industry and started to build factories which produce heavy industry, both military and non-military alike. Thus it is necessary that the State has factories for producing all types of atomic weapons, rockets, satellites, airplanes, tanks, mortars, naval ships, armored vehicles and all types of heavy and light weapons. It is necessary that the State has factories which produce machines, motors, materials, and electronics, and factories which have a relation with public property and light factories which have relation with the military or war industries." Article 74 of the Draft Constitution

These policies will not be implemented in isolation, rather they will be a part of a larger system and thus supported by political, economic and education policy. It's only when all of these work in cohesion, with a clear plan and state support, that the Muslim lands will be able to flourish and remove themselves from the mercy and exploitation of the corrupt Capitalist system.

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