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CAPITAL MANAGEMENT

ALTERNATIVE THINKING ABOUT INVESTMENTS

New China Perspectives

Welcome to the weekly issue of Morgan Creek's ***New China Perspectives****. It is comprised of research from Morgan Creek's China-based investment team together with curated articles of interest. In addition to timely political and economic news covering greater China, Morgan Creek's China team seeks to provide in-depth perspectives on investing in the technology, consumer and healthcare sectors in the region. Our research leverages the "on the ground" insights of our team together with Morgan Creek's decades-long experience in covering the region. Our team are focused, thematic investors primarily covering the technology, consumer, and healthcare sectors and investing in private companies and early-stage managers with deep local expertise. To learn more about our team and investment offerings, please email chinateam@morgancreekcap.com.*

Best Regards,

Mark W. Yusko

Mark W. Yusko
CEO & CIO

NOTES FROM THE BUND[1]

Similar to oil in the twentieth century, data is rapidly becoming the paramount commodity of the twenty-first. Semiconductors are necessary to process and compute data, and as a result have become the linchpin of our modern society. The invisible hand of the free markets has determined the development of the global semiconductor supply chain: chip design in the US, chip manufacturing in Taiwan and South Korea, and chip testing and assembly in China. However, with the increasing technology contest between world powers and globalization in apparent retreat, nations are beginning to restore and redefine chip supply chains.

Under this macro backdrop, China's semiconductor industry, while still nascent, appears to be growing despite measures to counter/limit its growth. In the next two newsletters, we would explore the impact of geopolitics on Chinese semiconductor companies, investigate how they have survived, and analyze the advantages China has as to build a semiconductor supply chain.

In this issue, we would discuss the following points:

- The general impact of geopolitics on China's semiconductor companies and how Huawei and SMIC reacted to the pressures
- Reasons why China was able to cope with the restrictions
- Multiple collateral consequences, which make a complete decoupling impossible

The impact of geopolitics on China's semiconductor companies

Huawei has managed to pivot its business in light of chip shortages

Since 2017, Chinese companies in certain technologically-advanced industries have experienced various pressures from abroad in an effort to contain their growth. Two companies that have faced arguably the toughest challenges are Huawei[2] and Semiconductor Manufacturing International Corporation ("SMIC") [0981.HK].

Huawei was added to the "Entity list" in 2019 that resulted in a significant hit to its consumer (cellphone) business due to chip shortage. Specifically, Huawei's overall revenue fell 26% from 2019.

Figure 1: Sanctions impact on Huawei revenue (USD, billion)

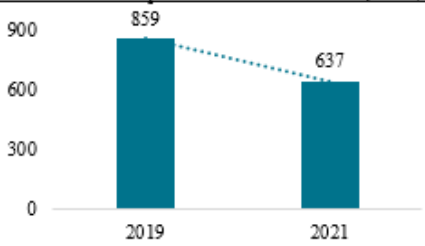


Table 1: Huawei segment & geographic revenue composition[3]

	2019	2021	Change
Consumer	55%	39%	-16%
Carrier	35%	45%	+10%
Enterprise	10%	16%	+6%

	2019	2021	Change
China	61%	66%	+5%
EMEA	25%	21%	-4%
Asia-Pacific	8%	8%	-
Americas	6%	5%	-1%

As a result, Huawei made subsequent strategic pivots to cloud (Huawei Cloud is now ranked top 5 globally) and industry digitization. Both these have managed to stem its revenue decline. Huawei has also spun off Honor, a sub brand of its cellphone division, in 2020. A little less than two years later, Honor is once again the largest brand by smartphone shipments in China (see chart below).

Figure 2: China (mainland) smartphone shipments by vendor, Q1 2019 to Q1 2022 (million)[4]

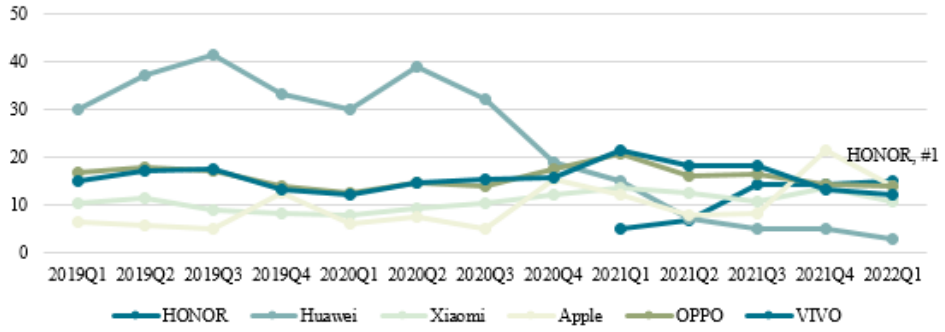


Figure 3: Sanctions impact on SMIC (USD, billion)

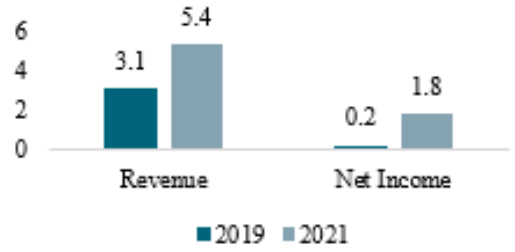


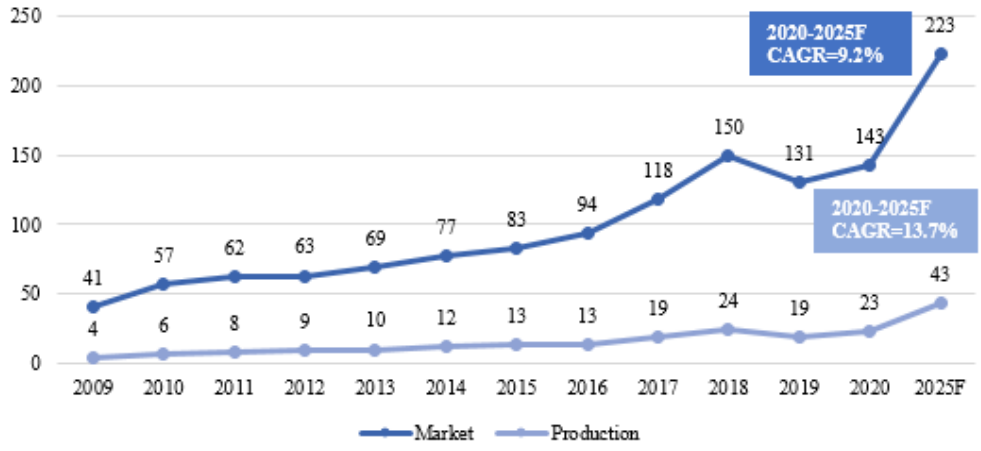
Table 2: SMIC geographic revenue composition[5]

	2019	2021	Change
China	59%	64%	+5%
EMEA	26%	22%	-4%
North America	14%	14%	-

Why China's semiconductor companies have survived

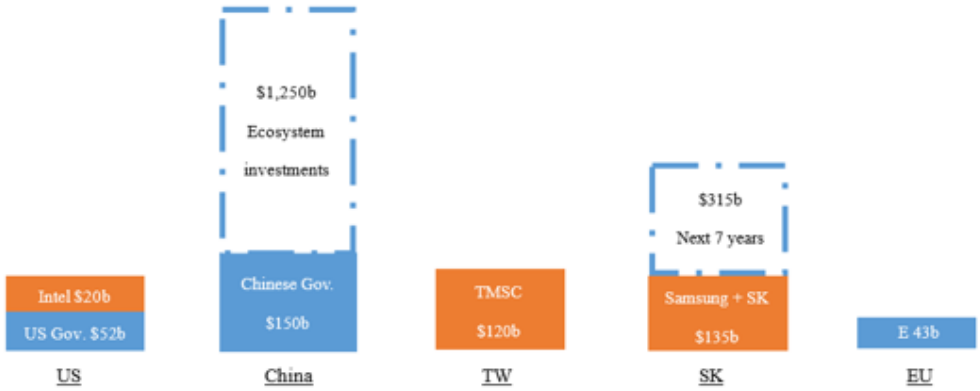
The single most important reason is the huge size of the Chinese semiconductor market. China is the largest integrated circuits ("IC") consumer in the world and imports more semiconductor chips than oil. This is because China is only currently capable of producing 16% of its semiconductor demand, and most of this is in the less technologically advanced mature nodes. The chart below illustrates this trend. The huge size of the market provides significant opportunities for local companies to grow.

Figure 4: Integrated Circuit (IC) Market vs. Production in China (USD, billion)[6]



Next, persistent and robust support from the Chinese government allows Chinese companies to stay in the game by investing in sufficient R&D annually to stay relevant in this rapidly evolving industry. As shown in the chart below, industry leader Taiwan Semiconductor Manufacturing Company ("TSMC") [TSM.N] has earmarked $120 billion in research and capex over the next few years. Samsung and SK Group has committed a similar amount, bolstered by the South Korean government. The US has recently passed a Chips and Science Act comprised of $52 billion direct subsidies into the chip industry.

Figure 5: China government can commit large sums to stay competitive with leaders



To give its domestic champions a chance to compete; the Chinese government has announced its contribution of $150 billion into the semiconductor industry. On top of that, the government has earmarked another $1.25 trillion to build and strengthen its semiconductor ecosystem. Having access to subsidies might not guarantee success, but in this technologically innovative industry, not having sufficient access to capital to innovate and stay relevant will guarantee failure.

Lastly, while there has been a lot of discussion on deglobalization, given how interconnected supply chains are today, technological decoupling will be a lengthy and economically painful process to all parties. As an illustration, BCG predicts that full semiconductor decoupling could cause US companies to lose 18% global market share and 37% revenue, and between 15,000 to 40,000 jobs.[7] In this scenario, the cost of chips would inevitably rise and worsen inflation.

As a result, despite tightening export restriction/controls in the semiconductor tools (EDA, equipment manufacturing, etc.) space in the past few years, leading key US/western companies' sales to China as a percentage of their overall revenue continues to rise, as illustrated in the tables below.

Table 3: China share percentage of companies in semiconductor industry[8]

EDA Co.	2019	2021	Change
Cadence	10%	13%	+3%
Synopsys	11%[9]	13%	+2%

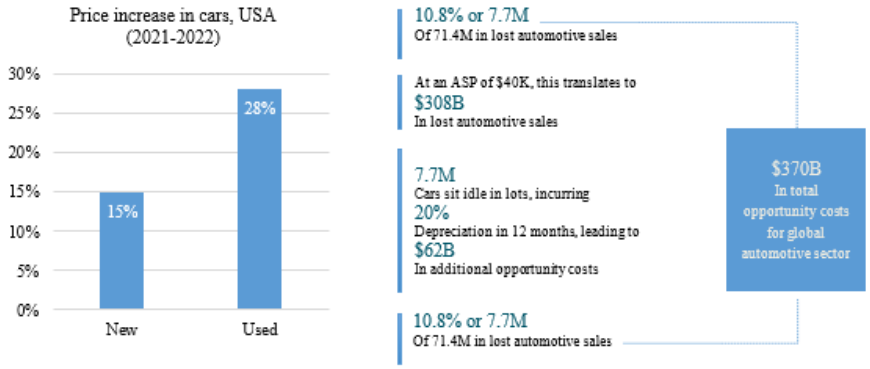
Equipment Co.	2019	2021	Change
Applied Materials	29%	33%	+4%
Lam Research	22%	35%	+13%
ASML	12%	15%	+3%

Due to the cost optimization of global supply chains, where much of the inventory is made available just in time ("JIT"), small disruptions could lead to significant second order consequences.

Consider the automobile industry, which continues to be affected by semiconductor shortages.

A modern car can easily have more than 3,000 chips, and a shortage of a single chip, even one that is cheap and low end, can bring the entire assembly line to a halt. Accenture estimates that the global automotive sector lost up to $370 billion[10] in total opportunity costs due to the inability to produce the vehicles originally planned because of chip shortages. Consumers paid the price in terms of record new and used car prices. The chart below illustrates the above two points.

Figure 6: Impact of chip shortage on automotive sector



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CHINA NEWS SPOTLIGHT

Chinese Dealmaker That Backed Tencent Casts a Wider Startup Net : Hillhouse, the private equity firm known for its bets on Tencent Holdings Ltd. and JD.com Inc., is now looking to back startups far earlier in their life cycles. The China-focused firm has set up a dedicated team with a mandate to seed 100 startups in three years, focusing on areas like new energy and biotechnology that have gained favor since Beijing cracked down on gaming and the consumer internet. Led by founding partner Li Liang, it will specialize in deals of $2 million to $3 million, far smaller than the investments the firm is generally known for. *Read More.*

China Steps Up Yuan Support as Currency Nears Weakest Since 2008: China made it more expensive to bet against the yuan with derivatives, ramping up support for the currency as it slides toward the weakest level against the dollar since the 2008 global financial crisis. The People's Bank of China said Monday it'll impose a risk reserve requirement of 20% on currency forward sales by banks. Since August, the central bank has sought to limit the yuan's losses through its daily reference rate as well as demanding that lenders set aside more foreign exchange as reserves. *Read More.*

Electric cars: Beijing extends exemption from 5 per cent purchase tax to end of 2023 in boost for sector: The exemption from a tax levied on electric vehicle (EV) purchases will be extended to the end of 2023, Beijing has announced, in an apparent effort to further bolster the use of battery-powered cars on mainland Chinese roads. A statement jointly published by the Ministry of Finance, State Taxation Administration and Ministry of Industry and Information Technology on Monday said buyers of all pure-electric, plug-in hybrid and fuel-cell cars will be exempt from paying a 5 per cent tax next year. *Read More.*

China EV Maker Leapmotor to Raise $800m in Hong Kong IPO: China's Zhejiang Leapmotor Technology is set to raise $800 million in its Hong Kong initial public offering (IPO), sources say, by pricing its shares at HK$48 ($6.12) each. That sum is less than the $1 billion the EV maker said it was aiming to raise in regulatory filings last week, but it will still be the city's largest share offering this year. The company originally planned to raise $1.5 billion but cut the size after a lukewarm response from investors. *Read More.*

China's XPeng revealed the world's fastest charging electric vehicle - 160 mph in 5 mins: In an attempt to tackle range anxiety, Chinese automaker XPeng has revealed the fastest charging electric vehicle, G9, which also features industry-first full-scenario driver assistance. The G9 model from XPeng features a brand-new powertrain system built on China's first 800 V Silicon Carbide (SiC) mass production platform. The 4C version of the G9 can add up to 160 miles (200 km) of CLTC range in as little as five minutes, thanks to the company's new 480 kW S4 supercharging stations, which means it can charge from 10-80 percent in just 15 minutes. *Read More.*

China's CNGR Teams Up With South Korea's SK Group on Lithium Materials: CNGR Advanced Material, a leading Chinese maker of lithium-ion battery cathode precursor, has agreed to work on lithium materials with a unit of South Korean conglomerate SK Group in a tie-up that will see them set up a research and development joint venture. Under a deal signed yesterday with

SK Ecoplant, the pair will cooperate on various projects, including the production of ternary precursor cathode materials and battery-grade lithium carbonate, as well as the R&D of battery-related and wastewater treatment technologies and precursor materials production, Changsha-based CNGR said today. *Read More.*

Seagen and Zai Lab Announce Regional Strategic Collaboration and License Agreement for TIVDAK® (tisotumab vedotin-tftv): Zai Lab Limited (Nasdaq: ZLAB; HKEX: 9688), a patient-focused, innovative, commercial-stage global biopharmaceutical company, and Seagen Inc. (Nasdaq: SGEN), a world leader and pioneer in antibody-drug conjugate (ADC) therapies today announced an exclusive collaboration and license agreement for the development and commercialization of TIVDAK® (tisotumab vedotin-tftv) in mainland China, Hong Kong, Macau, and Taiwan. TIVDAK is the first and only ADC approved in the U.S. for the treatment of adult patients with recurrent or metastatic cervical cancer with disease progression on or after chemotherapy. *Read More.*

Simcere and Almirall Enter into a Licensing Agreement for IL-2 mu-Fc: Simcere Pharmaceutical Group (2096.HK), an innovation and R&D-driven pharmaceutical company, and Almirall S.A. (BME: ALM), a global biopharmaceutical company focused on skin health; announced today that they have entered into an exclusive licensing agreement for Simcere's IL-2 mutant fusion protein (IL-2 mu-Fc) autoimmune drug candidate, SIM0278. Under the agreement, Almirall will be granted an exclusive right to develop and commercialize SIM0278 for all indications outside of the Greater China region (Mainland China, Hong Kong, Macau and Taiwan). Simcere will retain all rights to develop and commercialize SIM0278 within Greater China. *Read More.*

[1] The Bund is a historic waterfront area in central Shanghai, where Morgan Creek's office is located. From the 1860s to the 1930s, it was the rich and powerful center of the foreign establishment in Shanghai, operating as a legally protected treaty port. The picture above is part of the historical waterfront.
[2] Please refer to our previous newsletters delving deeper into Huawei for more information.
[3] Source: Huawei annual reports.
[4] Source: Canalys Newsroom - HONOR takes the crown in China after smartphone market correction in Q1 2022
[5] Source: SMIC annual reports.
[6] Source: IC Insights as of 1/6/2021.
[7] Source: Report Shows Risks of Excessive Restrictions on Trade with China - Semiconductor Industry Association (semiconductors.org)
[8] Source: Annual reports from public companies. Data as of 2020, as Synopsys did not break out China revenue prior to that.
[9] Note: Data as of 2020, as Synopsys did not break out China revenue prior to that.
[10] Source: The Power of the Semiconductor Value Chain | Accenture