

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@morgancreekcip.com.

Best Regards,

Handwritten signature of Mark W. Yusko in blue ink.

Mark W. Yusko
CEO & CIO

NOTES FROM THE BUND¹

This is the second issue of the analysis on the Chinese semiconductor industry. In the last newsletter, we discussed how and why Chinese companies have survived chip supply constraints and the geopolitical impact to global supply chains. In this issue, we will dig deeper to uncover the reasons China has a good chance of building a domestic chip supply chain in the coming years.

We highlight:

- The largest volume of semiconductor usage is not cutting edge; meaning that China can first focus on trailing edge nodes and innovate their way up over time
- Chinese foundries have a significant cost advantage vis a vis their global peers
- Chinese semiconductor companies have made some recent technical and commercial breakthroughs

Large opportunity for domestic substitution

Much of semiconductor chip demand globally does not require the most cutting-edge chips. In fact, over 90% of semiconductor sales by volume is trailing edge chips, or those larger than 10nm. However, given the higher prices for advanced chips, they account for ~28% of the market by revenue. While Semiconductor Manufacturing International Corporation ("SMIC") is currently unable to cost effectively manufacture advanced nodes due to lack of access to EUV lithography machines, they are capable of manufacturing chips for the vast majority of the chip market.

Figure 1: Monthly installed capacity share

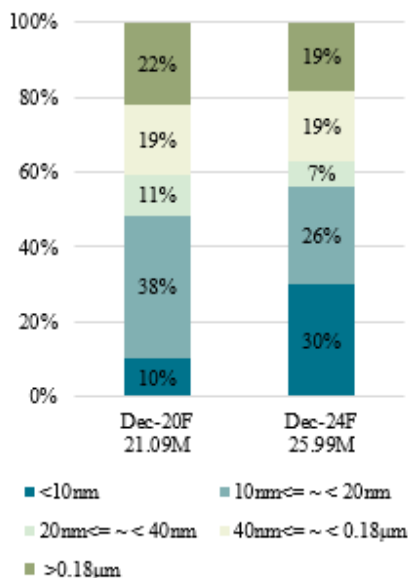
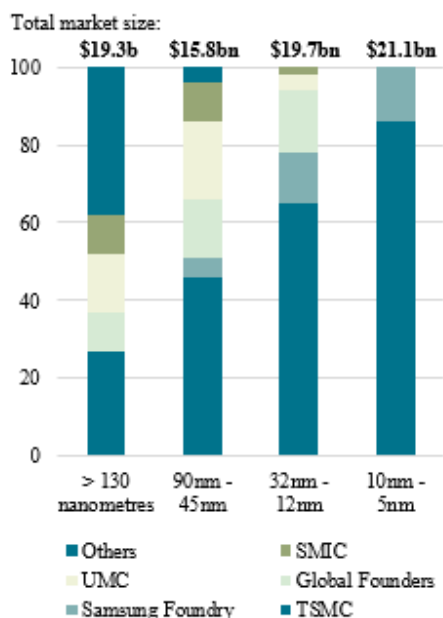


Figure 2: Pure-play foundry revenue, 2020 (%)



In fact, as pointed out in the last newsletter, it is the trailing edge semiconductors (those which SMIC is capable of large-scale commercialization) that had the most severe scarcity at the height of the global chip shortage. A recent McKinsey report[1] highlights that the growth for leading edge chips, used mainly for high-end PCs and smartphones, have plateaued. The chart below shows that 70% of new chip demand would come from three industries – computing/data storage, automotive, and wireless communication. Many companies in these industries, for example automobiles, do not require cutting edge chips (given their different use cases and that they do not lack constraints in real estate so do not require the most up to date/smallest chips).

Figure 3: Semiconductor usage in selected OEM devices [in % of total 8'' wafer equivalents]³

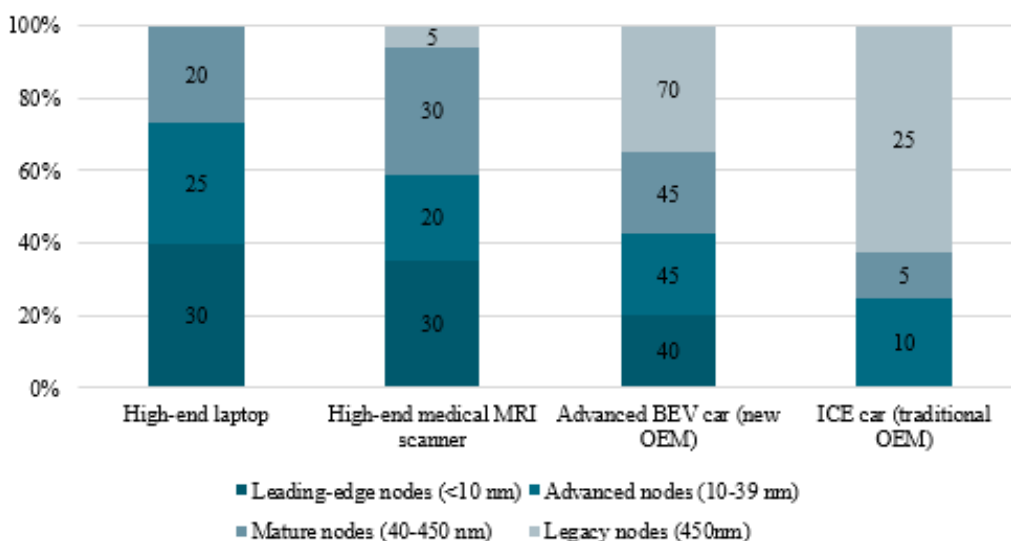


Figure 4: Global semiconductor market value by vertical (USD. billion)

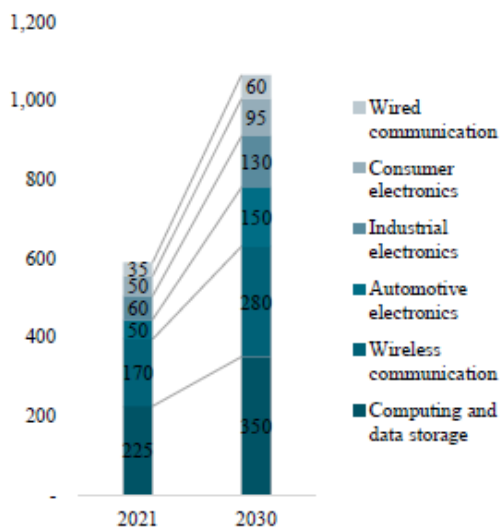
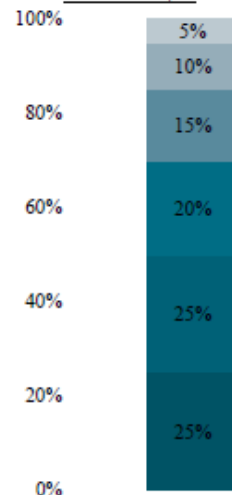


Figure 5: Growth contribution per vertical 2021-2030. %

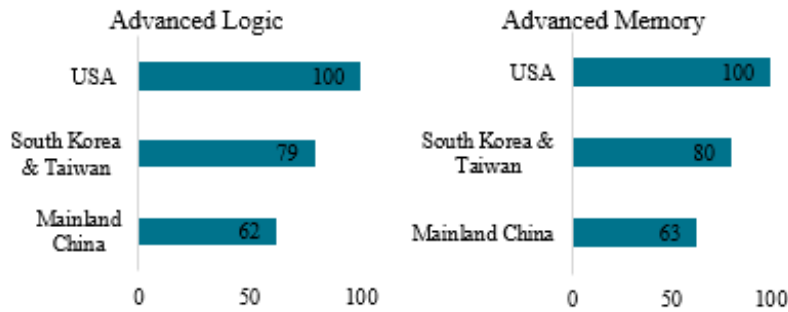


Taiwan Semiconductor Manufacturing Company (“TSMC”) has also recognized this and has announced expansion of its mature nodes by 50% in the coming years[1], with a focus on the 28nm nodes in particular.

However, for these legacy nodes, Chinese foundries have a cost advantage, as illustrated in the charts below. Compared to their counterparts in the US and developed Asia, Chinese foundries can

be 23%-37% more cost effective.

Figure 6: Total 10-year cost of ownership semiconductor foundries by type (USA indexed to 100)

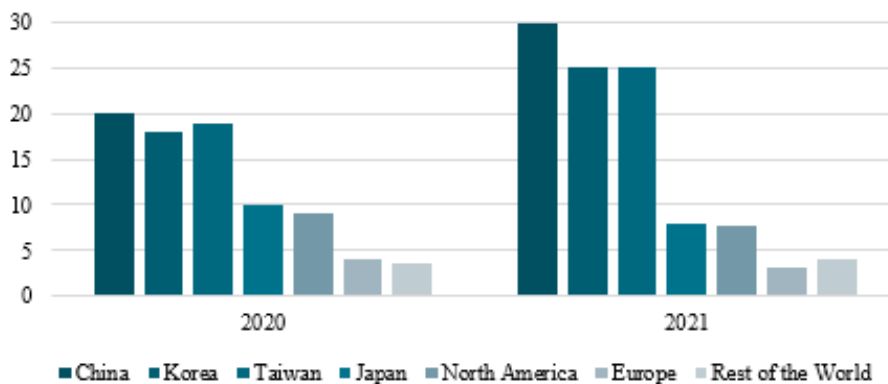


This means that Chinese companies can first focus on the large, existing trailing edge chip markets, where they have competitive advantage vs their global counterparts, and gradually innovate their way up the curve over time.

Significant indigenous technology advancement despite external restrictions

China has also had significant technological and commercial achievements. One domestic bottleneck in chip production has been chip manufacturing equipment, which is dominated globally by the US (Lam Research, Applied Materials), Netherlands (ASML) and Japan (Tokyo Electron). China has a huge appetite for these machines, as illustrated in the chart below, but has had [export restrictions](#) on the types of lithography machines applied to it. Developing a domestic alternative is crucial to achieving supply chain independence.

Figure 7: China has been the biggest buyer of chip making gear for two straight years (USD. billion)



Two recent announcements show how far China has advanced:

- Despite inability to access cutting edge EUV equipment required to manufacture advanced chips, [SMIC managed to make 7nm chips](#)
- Shanghai Microelectronics announced that it [has delivered China's first advanced packaging lithography machine](#)

Top tier companies like Apple are taking notice of this and has begun to include Chinese chip companies in their global supply chains, lending significant credibility to their commercialization potential:

- Chinese NAND flash memory chipmaker Yangtze Memory (“YMTC”) [passed Apple's verification test](#) and will reportedly begin supplying storage chips for Apple. Prior to this, the sector was dominated by South Korean (Samsung, SK Hynix), US (Micron, Western Digital) and Japanese (Kioxia) companies
- Apple's Chinese contractors have also begun to actively expand their expertise in advanced chip packaging, showing their ability to climb up the value chain, where they were previously awarded minor roles in assembly and white-labeling

Summary

To recap, China has both a commercial and geopolitical motive to boost its chip industry as the global landscape in the semiconductor industry continues to shift with geopolitical tensions continuing to dominate headlines. This is the twenty-first century arms race and no one can afford to sit on the sidelines.

Therefore, given the size of the markets in China and its importance in the global supply chains, we believe that economic considerations will ultimately be more crucial when stakeholders make long-term decisions. It will be interesting to watch how this sector evolves with time.

[Click here](#) to see back issues of New China Perspectives

U.S. inspections of China corporate audits at 'very early stage,' PwC says: U.S. regulatory inspections of audits of Chinese companies listed in the United States have begun and it could be months before the conclusions are known, PwC Global Chairman Bob Moritz said. A China-U.S. agreement in August allows U.S. regulators, for the first time, to inspect China-based accounting firms that audit New York-listed companies to help resolve a dispute that threatened to boot more than 200 Chinese companies from U.S. exchanges. [Read More.](#)

China extends currency swaps with European Central Bank: China's central bank extended its bilateral currency swaps with European Central Bank, worth 350 billion yuan or 45 billion euros, according to a statement published on the Chinese central bank's website on Monday. The swaps extension will help deepen bilateral cooperation and safeguard financial market stabilization, the Chinese central bank said. [Read More.](#)

China's holiday home sales fall 37.7% year over year, survey shows: Chinese new home sales by floor area fell 37.7% year-on-year over the week-long National Day holiday starting from Oct. 1, a private survey showed on Saturday, as tough COVID-19 curbs further dented fragile demand. The property market has lurched from crisis to crisis, with slumping sales and developers defaulting on debts, while consumer confidence has been soured by repeated COVID-19 lockdowns and a mortgage boycott. [Read More.](#)

Betting on flexibility, China's Nio will only rent cars in new EU markets: Chinese electric vehicle maker Nio (9866.HK) will only lease its cars when it launches in four European markets this year, its CEO told Reuters on Friday, betting that flexibility will be a key selling point as drivers switch to the new technology. Users will be able to lease a car with a 75 gigawatt hour battery for 1,199-1,295 euros (\$1,171-\$1,264) a month depending on the length of the subscription, which can be as short as a month. [Read More.](#)

CALB's Debut Was Lukewarm, But China Has Buckets of EV Funding: Life as a newly minted public company didn't get off to the roaring start that CALB, China's third-largest electric vehicle battery maker, might have hoped for, particularly after rivals LG Energy Solution and CATL soared 68% and 44%, respectively, on their day one debuts. [Read More.](#)

Mobile Legends Developer Moonton Wins Defamation Lawsuit Against Tencent: According to Jiemian, the court ruled in favor of MOONTON and upheld a previous verdict that Tencent's actions amounted to corporate slander, in an effort to discredit the game developer and weaken their position in Indonesia. The report says that Tencent had hired lawyers to approach MOONTON's partners in Indonesia, RevivalTV, ahead of the MPL esports tournament. As per Yicai's report, Tencent had used intimidating language, claiming that they'd already won the ongoing plagiarism court case between Mobile Legends and Riot's League of Legends (Riot is owned by Tencent), despite no such verdict existing. [Read More.](#)

WuXi Biologics Co. Removed from U.S. Unverified List):

WuXi Biologics, a global Contract Research, Development and Manufacturing Organization (CRDMO), announced that its subsidiary WuXi Biologics Co., Ltd. located in Wuxi city was removed from the Unverified List (UVL) by the U.S. Department of Commerce, effective October 7, 2022. In February 2022, two subsidiaries of WuXi Biologics, WuXi Biologics Co., Ltd. and WuXi Biologics (Shanghai) Co., Ltd., were placed on the UVL due to delayed verifications required for the receipt of certain products exported from the United States. In June, WuXi Biologics Co., Ltd. successfully completed the on-site end-use check conducted by the U.S. Department of Commerce, in coordination with China's Ministry of Commerce (MOFCOM). [Read More.](#)

Simcere agree license deal of \$492M USD with Almirall: 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. [Read More.](#)

¹The 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.

²Source: [The semiconductor decade: A trillion-dollar industry | McKinsey](#)

³Source: [How the semiconductor crisis affects the automotive industry | Roland Berger](#)

⁴Source: [TSMC Tells Its Customers to Get Off Older Nodes, Move to 28nm - ExtremeTech](#)

Important Disclosures

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