MANY MEGATRENDS DEPEND ON SEMICONDUCTORS. WHAT'S HAPPENING IN THE SPACE?

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When looking at semiconductors today, competition is visible across all fronts.

Governments Are Competing with Each Other to Ensure Stable Future Supplies

The phrase "chip shortage" has made quite an impression.[1]

- The U.S. has earmarked an enormous one-time sum, $77 billion, in subsidies and tax credits to boost domestic chip production
- China is prepared to spend more than $150 billion through 2030
- South Korea is poised to offer an array of incentives over the coming five years, valued at roughly $260 billion
- The European Union is seeking to spend $40 billion
- Japan is seeking to spend $6 billion

In 2021, revenues in semiconductors were $553 billion, and they are expected to grow to $1.35 trillion by 2030. Roughly three-quarters of global chip-making capacity is located in China, Taiwan, South Korea and Japan. The U.S. only sits at about 13%, whereas the European Union sits at roughly 9%.[2]

All Chips Are Not the Same

The COVID-19 pandemic has shown different economies the importance of securing the supply of semiconductors. One thing to note is there is a wide variety of types of semiconductors, and some countries are seeking to secure one type of supply over another. China's push, at least presently, is aimed less at the cutting edge and more at being a higher volume player in the market for lower priced but still essential chips.[3] Some chips that are necessary for the production of automobiles, for example, could be valued at $1 dollar or less on a per-unit basis,[4] far from the most cutting edge in the space.

Company Results Are Showcasing Both Successes and Failures

Intel's second-quarter earnings, which were poorly received, reported revenue falling 17% relative to the first quarter of 2022. This was the company's worst sequential quarter-to-quarter revenue performance going back to the year 2000. Intel also noted a delay to its next generation server chip, Sapphire Rapids, and that its data center chip business would grow more slowly than the overall data center market for two years.[5] This compares to Taiwan Semiconductor Manufacturing Co. (TSMC) growing revenue by 37% and profit by 76% year over year.[6]

Earlier in 2022, Samsung reportedly lost its two biggest foundry customers, Qualcomm and Nvidia, to TSMC. Reports indicate that they were not satisfied with Samsung's capability in the 4- and 5-nanometer space, which represents the current cutting edge in semiconductor manufacturing. TSMC captures greater than 50% of foundry market share, operating at a market share level roughly three times that of Samsung. Still, Samsung did hold a recent ceremony to celebrate its first shipment of 3-nanometer chips, hitting this milestone faster than TSMC.[7] In contrast, it is estimated that roughly 25% of TSMC's business is from Apple, and then Nvidia, Qualcomm and Advanced Micro Devices are estimated

to provide about another 5% each.[8]

Capital Expenditures Set Companies Up for Future Growth

TSMC is also investing at an incredible clip, aiming to spend up to $44 billion in 2022 compared to Samsung's $12 billion, although Samsung has announced a spending plan to total $151 billion between now and 2030.[9] Intel announced in its most recent, admittedly tough, quarterly results a plan to cut planned capital expenditures in 2022 by 15% to a level of $23 billion.[10]

Samsung is also facing competition in the DRAM business, as Micron and SK Hynix have introduced some of the most advanced chips for these purposes. Still, even amid the competitive onslaught, Samsung's DRAM market shares sits at about 40%. In the smartphone application processor market, Samsung's market share was 6.6%, compared with Qualcomm at 37.7%, MediaTek at 26.3% and Apple at 26%.[11]

Time to Invest?

Semiconductor companies tend to follow a particular rhythm, seeing strong demand, making investments, increasing supply, hitting levels of oversupply at least in certain types of chips and then waiting for the market to re-attain something closer to equilibrium. Today, we may be in the tail-end of the chip shortage and it may not, at least in the short run, be the time to expect an immediate performance pop in the share prices of most semiconductor companies.

However, any megatrend that touches technology in any way requires semiconductors to function—in a sense if any of them grow, the demand for necessary semiconductors will also grow. Having a multi-year time horizon could be of greater interest, in our view.

If we put aside the fact that it would be difficult for many megatrends—cloud computing, cybersecurity, energy storage, internet of things, to name a few, to function without access to semiconductors—at WisdomTree, within our Artificial Intelligence strategy, we took the additional step of specifying the need to directly own semiconductor stocks that are most involved in AI today. Semiconductors, in fact, sit beside the Other AI Hardware, AI Software and Innovation categories of companies. Sometimes these different components tend to exhibit different performance profiles, recognizing that as AI itself is more and more broadly used, different types of companies will tap into this economic value being added.

Click here for full list of WTAI fund holdings.

[1] Source: Jiyoung Sohn, "The U.S. Is Investing Big in Chips. So Is the Rest of the World," Wall Street Journal, 7/31/22.

[2] Source: Sohn, 7/31/22.

[3] Source: Dan Strumpf & Liza Lin, "China Bets Big on Basic Chips in Self-Sufficiency Push," Wall Street Journal, 7/24/22.

[4] Source: Dan Gallagher, "No Quick Fix for Auto Chip Shortage," Wall Street Journal, 2/9/21.

[5] Source: Tae Kim, "Intel Stock Will Plunge Further, Analyst Says, after 'Worst' Quarter He Has Ever Seen," Barron's, 7/29/22.

[6] Source: Craig Mellow, "Taiwan Semi's Spending Spree Will Pay Off Big in the Long Term," Barron's, 7/29/22.

[7] Source: Song Jung-a & Christian Davies, "Samsung Seeks to Reassure Markets over Semiconductor Competitiveness," Financial Times, 7/30/22.

[8] Source: Craig, 7/29/22.

[9] Source: Jung-a, 7/30/22.

[10] Source: Dan Gallagher, "Intel Shows Limits of Chips Act," Wall Street Journal, 7/29/22.

[11] Source: Jung-a, 7/30/22.

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Semiconductor : A semiconductor is a material product usually comprised of silicon, which conducts electricity more than an insulator, such as glass, but less than a pure conductor, such as copper or aluminum. Their conductivity and other properties can be altered with the introduction of impurities, called doping, to meet the specific needs of the electronic component in which it resides.

Capital expenditures : Spending by a company typically made to enhance longer-term productive capacity.

Artificial intelligence : machine analysis and decision-making.