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

Christopher Gannatti – Global Head of Research, WisdomTree.
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Governments are competing with each other to ensure stable future supplies

The phrase 'chip shortage' has made quite an impression¹.

- The US has earmarked an enormous one-time sum, \$77 billion, in subsidies and tax credits to boost chip production within the US
- 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 (EU) is seeking to spend \$40 billion
- Japan is seeking to spend \$6 billion

In 2021, revenues in semiconductors were \$553 billion, and are expected to grow to \$1.35 trillion by 2030. Roughly three-quarters of chip-making capacity is in China, Taiwan, South Korea and Japan. The US only sits at about 13%, whereas the EU 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 that there is a wide variety of semiconductors, and some countries are seeking to secure one type of supply over another. China's push is aimed less at the cutting edge and more at being a higher volume player in the essential part of the market for lower priced but still important chips³. Some necessary chips that inhibit the production of automobiles, for example, could be valued at \$1 dollar or less on a per-unit basis⁴, far from the most cutting edge in the space.

Company results are showcasing both successes and failures

Intel reported that Q2 earnings that received a bleak reception, with revenue falling 17% relative to Q1 of 2022. This was the 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 centre chip business would grow slower than the overall data centre market for two years⁵. This compares to Taiwan Semiconductor Manufacturing Company (TSMC) growing revenue 37% and profit by 76% year-over-year⁶.

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-nanometre 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-nanometre chips, hitting this milestone faster than TSMC⁷. In contrast, it is estimated that roughly 25% of TSMC's business is from Apple, and then Nvidia, Qualcomm and Advanced Micro Devices (AMD) are estimated to provide about another 5% each⁸.

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, even if Samsung has announced a spending plan to total \$151 billion between now and 2030⁹. Intel has 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 billion¹⁰.

Samsung is also facing competition in the dynamic random access memory (DRAM) business, as Micron and SK Hynix have introduced some of the most advanced chips for these purposes. Still, even amidst the competitive onslaught, Samsung's DRAM market shares sit 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 in certain types of chips, then waiting for the market to re-attain something closer to equilibrium. Today, we may be at 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. Since not all semiconductors are the same, it is also worth recognising that different companies may be more associated with different megatrends—for instance, certain companies are doing more in Artificial Intelligence (AI) model training space, whereas others are doing more in the industrial and automobile space. The supply/demand balance within different types of semiconductors will not necessarily be the same.

Sources

¹ Source: Sohn, Jiyoung. "The U.S. Is Investing Big in Chips. So Is the Rest of the World." Wall Street Journal. 31 July 2022.

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³ Source: Strumpf, Dan & Liza Lin. "China Bets Big on Basic Chips in Self-Sufficiency Push." Wall Street Journal. 24 July 2022.

⁴ Source: Gallagher, Dan. "No Quick Fix for Auto Chip Shortage." Wall Street Journal. 9 February 2021.

⁵ Source: Kim, Tae. "Intel Stock Will Plunge Further, Analyst Says, after 'Worst' Quarter He Has Ever Seen." Barron's. 29 July 2022.

⁶ Mellow, Craig. "Taiwan Semi's Spending Spree Will Pay Off Big in the Long Term." Barron's. 29 July 2022.

⁷ Source: Jung-a, Song & Christian Davies. "Samsung seeks to reassure markets over semiconductor competitiveness." Financial Times. 30 July 2022.

⁸ Source: Craig, 29 July 2022.

⁹ Source: Jung-a, 30 July 2022.

¹⁰ Source: Gallagher, Dan. "Intel Shows Limits of Chips Act." Wall Street Journal. 29 July 2022.

¹¹ Source: Jung-a, 30 July 2022.

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