Global Insights

Is the Semiconductor Cycle Over?

The global semiconductor crisis isn’t over, but we have reason to believe that a peak might be forming. While we are mindful that identifying the top of a cycle is fraught with difficulty, it would be prudent to take a more cautious stance toward the industry, as it faces a number of growing headwinds. We view slower sales growth, shifting spending patterns and signs that supply chains are easing as near-term challenges.

However, Longer-term, semiconductors offer an attractive investment opportunity. In our May 12 Global Insights, “Semiconductor Arms Race,” we explored the industry’s challenging political environment. Since we published the report, some important geopolitical developments have underlined our contention that long-term investors should be prepared for sharper boom-and-bust cycles as a function of geopolitical maneuvering.

- Semiconductor manufacturers have benefited from greater demand for electronic devices, which has in turn boosted demand for semiconductors. We anticipate that the industry will struggle in the near term, as demand wanes and sales decline.
- Supply-chain constraints are easing just as semiconductor manufacturers have ramped up production. Although demand could outpace supply in 2022, easing bottlenecks and inventory builds could sap demand for semiconductors.
- In the near-term we recommend investors in semiconductor stocks lock in gains given the rapid rise in prices and allocate profits to high quality equities with pricing power given continued inflation pressures.
- Longer-term, we remain constructive on semiconductors given big investments in semiconductor manufacturing, the ongoing automation of traditional manufacturing, and expansion in the internet of things.
**GLOBAL INSIGHTS**

**Are we there yet?** The semiconductor crisis isn’t over yet, but we have reason to believe it could be peaking as investors focus on near-term risks. Amid a global chip shortage, strong consumer demand for electronic devices has driven up semiconductor prices, and, at a total return of 53% for the year to date, the industry is positioned to challenge its best calendar year performance since at least 2003 (see Exhibit 1).

At the onset of the global pandemic, semiconductor manufacturers benefitted from a perfect storm, as healthy demand for devices outstripped inputs—largely benefitting chip makers. As demand for electronic devices skyrocketed, worldwide sales of semiconductors jumped across all major product categories. According to the Semiconductor Industry Association, global semiconductor sales reached $48.3 billion in November 2021—an all-time high and a $1 billion increase from the prior month. While it might be tempting to point to the elevated sales as confirmation of continued strength, we anticipate that the sector will face near-term headwinds amid waning demand. A drop in sales is the first and most obvious sign of a decline. Although Interactive Data Corporation, a provider of financial data and analytics, expects the semiconductor market to grow by 17.3% in 2021, sales growth has recently weakened following months of steady increases (see Exhibit 4).

**Exhibit 1: A Boom in Global Semiconductor Demand Has Supported Record Returns**

![Graph showing MSCI World Semiconductor & Semiconductor Equipment Index](image)

Just as the pandemic fostered significant pull-forward in demand for durable goods, it is natural to expect that improving conditions and a partial reversal of factors will engender demand for services. As homes turned into offices and classrooms, consumption patterns favored the semiconductor industry given its strategic importance as an input for modern devices. However, as economic activity normalizes, we expect demand for durable goods to moderate.

For the purposes of our analysis, we consider US personal consumption expenditures to be a proxy for global spending. Spending on durable goods accelerated amid the pandemic and peaked 45% above pre-COVID-19 levels. Notably, durable goods expenditures peaked during the second global wave of COVID cases and have recently declined to just 35% above pre-COVID levels. We anticipate the reading will continue to move toward the prior trend as economic activity normalizes despite an expected increase in cases due Omicron, a new variant of the coronavirus. As behavior patterns shift consumption away from consumer durables, we anticipate that demand for semiconductors will also decline, calling into question current excessive investor bullishness. Businesses are also adjusting, as evidenced by Morgan Stanley’s October 5 Q21 CIO survey suggesting that hardware spending in 2022 will be weaker (see Exhibit 2).

**Exhibit 2: Weaker Spending Intentions in 2022 Are a Headwind for Semiconductors**

![Bar chart showing external IT spending intentions](image)

If supply-chain chaos and robust demand shaped 2021, the coming year will likely be geared toward inventory rebuild and capacity expansion, with evidence of both already beginning to appear. For example, the number of weeks between when a semiconductor is ordered and when it’s delivered recently increased by the smallest amount since July 2020. Although these lead times remain stubbornly high, at 21.9 weeks, their slower pace of growth suggests we could be nearing peak supply chain congestion (see Exhibit 3). Furthermore, large-scale capacity expansion will likely kick into overdrive in the coming quarters. In fact, in response to shortages, chipmakers are building excess inventory. Morgan Stanley & Co. Research’s semiconductor team points to days of inventory at semiconductor companies, which is 16 days above the 10-year historical median. While, from where we sit, near-term opportunities at the index level are limited, over the longer term, the industry appears to offer investors an attractive way to access to advanced technologies. That being said, we are mindful that the industry could be subject to increased volatility over time, given the geopolitical
environment.

**Exhibit 3: Chip Lead Times Are Beginning to Slow**

![Graph showing average delivery time for chips over time from 2017 to 2021.](source image)


Longer-Term Policy Implications for China. China, which is one of the world’s largest users of semiconductors, does not yet have the capacity to produce the advanced chips that are required for complex electronic devices like smartphones. Therefore, the country must rely on the US, Taiwan and South Korea, which exposes it to national security risks. In response, President Xi Jingping appointed Liu He—China’s top economic policy official—to oversee its chip-making initiative. Despite a strong financial commitment, China currently lacks the human capital to succeed. According to a report published this year by the China Institute for Educational Finance Research at Peking University, there is a shortfall of 300,000 semiconductor specialists in the country. China has begun to encourage universities to create schools dedicated to chips. Examples include the specialized chip college at Tsinghua University, established in April, and the school of integrated circuits at Peking University, established in July. We believe China’s emphasis on increasing self-reliance will have a lasting impact on the industry.

**Longer-Term Policy Implications for the US.** Last month, President Biden signed the Build Back Better bill into law. The bill, which features an infrastructure package of approximately $2.0 trillion, includes measures that commit more than $50 billion to the semiconductor industry, along with a focus on research in quantum computing and artificial intelligence. Furthermore, to incentivize semiconductor manufacturing, the bill included an Advanced Manufacturing Investment Credit, which creates an investment tax credit for buildings and equipment used to manufacture semiconductors. That being said, the US government must address the fact that many US companies are still investing in the Chinese semiconductor ecosystem. According to the research firm Rhodium Group, US venture capitalist firms and other private investors participated in 58 investment deals in China’s semiconductor industry from 2017 to 2020. In response, in July the Biden administration announced that it is examining ways in which private US investment abroad may be enhancing the technological capacity of foreign competitors and potentially threatening US national security.

With national security top of mind for the US government, the Department of Commerce’s Bureau of Industry and Security (BIS) released a request for information (RFI) calling for US and non-US entities throughout the semiconductor supply chain to share information. Specifically, companies were called on to share information about their capacity, production practices, inventories and market demand, as the BIS seeks to create a strategy for combating the global chip shortage. Many non-US companies were contacted, including some in Taiwan and South Korea, thereby angering China and potentially elevating tensions in East Asia.

**Investment Implications**

Although the semiconductor crisis is not over, near-term investment in the semiconductor industry is fraught with risk. We worry that the industry’s aggressive response to shortages has created near-term headwinds and recommend that investors lock in gains. We suggest they allocate profits to high quality stocks with pricing power, given inflation pressures, and urge new investors to wait for a better entry point.

Longer-term, we remain constructive on semiconductors given big government and corporate investments in semiconductor manufacturing, the ongoing automation of traditional manufacturing, and expansion in the internet of things. We note that investors should be mindful that geopolitics will likely shape the industry’s boom-bust nature going forward.
Charts You Can't Miss

Exhibit 4: Recent Trends Suggest Semiconductor Sales May Have Peaked

![Year-Over-Year Change in Global Semiconductor Sales](source: Bloomberg, Morgan Stanley Wealth Management Global Investment Office as of Sept. 30, 2021)

Exhibit 5: Semiconductor Outperformance Reflects Cyclical Behavior Within Technology

![Equal-Weight Semiconductor/Equal-Weight Software](source: Bloomberg, Strategas, Morgan Stanley Wealth Management Global Investment Office as of Nov. 11, 2021)

Exhibit 6: The Shift in Spending on Durable Goods Reflects Supply-Chain Chaos


Exhibit 7: Manufacturers of Semiconductors Face Strong Demand

![Year-Over-Year Change in South Korea Semiconductor Industrial Production](source: Bloomberg, BCA Research, Morgan Stanley Wealth Management Global Investment Office as of Oct. 31, 2021)

Please refer to important information, disclosures and qualifications at the end of this material.
Current Readings From Our Quantitative Framework

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- 🍁: Favorable
- 🍁: Improving

Ongoing Development Spotlight

Firms headquartered in the US were responsible for the largest share of the global semiconductor market by sales in 2020. Given the role that semiconductors play in the US-China innovation race and China’s commitment to boosting its capabilities, we expect the country to make gains. That being said, we are not yet convinced it will be able to achieve self-reliance over the intermediate-term, as it currently lacks the subject matter experts needed to make meaningful progress.

Exhibit 8: 2020 Global Semiconductor Industry Market Share by Sales

Source: SIA, Morgan Stanley Wealth Management Global Investment Office as of Sept. 2021
Note: Sales based on the location of company headquarters.
GLOBAL INSIGHTS

Disclosure Section

Index Definitions

SOLACTIVE CHINA ELECTRIC VEHICLE AND BATTERY INDEX This index represents Chinese companies that are active in the field of electric vehicles as well as batteries related to electric vehicles.

For other index, indicator and survey definitions referenced in this report please visit the following: https://www.morganstanley.com/wealthinvestmentsolutions/wmir-definitions

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