

Cashing in the chips: Artificial intelligence (AI) chip makers in Asia



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Asia is poised to capitalize on the AI trend with chip manufacturers

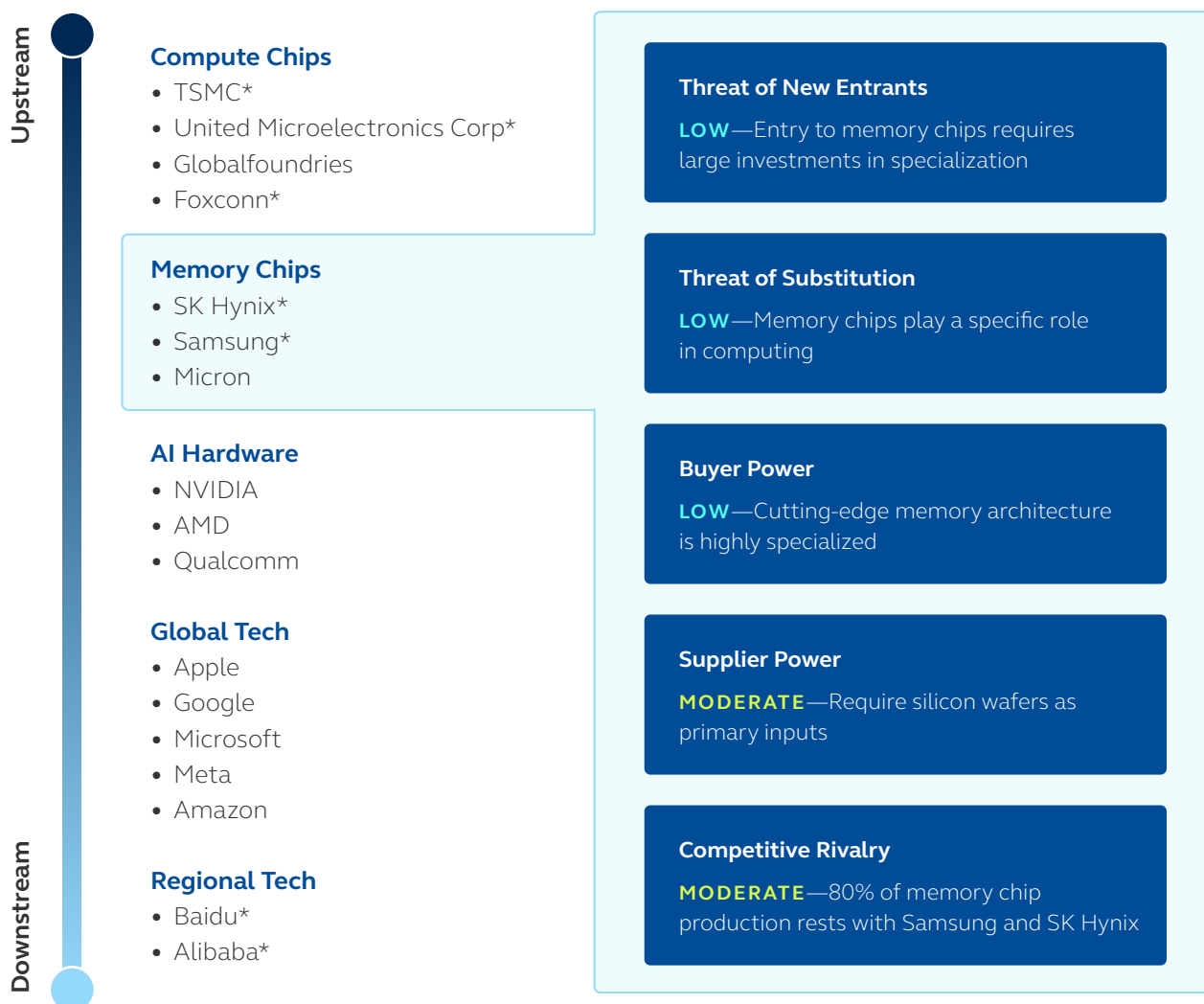
AI is a field that has seen dramatic growth in the last 18 months. Emergent applications such as ChatGPT, copilot applications, and even image generation tools have caught enormous mainstream interest and stand to revolutionize the way we view productivity. The last decade of computing predominately focused on big data, machine learning, and search algorithms. The next decade is shaping up to focus on complex AI that leans into content creation, ensemble modeling, reasoning, and even autonomy. The significant leap in AI computing, in turn, caused a surge in demand for products such as central processing units (CPUs), graphics processing units (GPUs), and memory chips. Indeed, the chip-making industry is going to see growth from this trend which may ultimately translate to attractive financial investment prospects. It becomes even more interesting for Asia—home to a large part of the chip-making industry, and in some segments, functioning as their global epicenter.

It is through investing in Asia that investors can gain exposure to the prospects of its chip-making industry. Huge names in chip manufacturing are headquartered in the region: the most prominent is Taiwan Semiconductor Manufacturing Company (TSMC) which manufactures chips, like CPUs and GPUs for a host of clients, spanning from Nvidia to Apple. However, there are also more specialized chip manufacturing segments like memory

chips, which include big names Samsung and SK Hynix. These two companies by themselves comprise 80% of the global memory chip market by sales volume. This presents massive opportunity for both companies as memory chips are a crucial upstream input to downstream technology products, like graphics cards, data storage, and mobile phone components.

High bandwidth memory (HBM) is a particularly important innovation space as only companies specializing in memory chips can effectively invest in cutting-edge architectures that facilitate the advanced computations required by AI. For example, SK Hynix has invested heavily in “stacking” technology to manufacture HBM3, the latest iteration of high-speed, rapid-access memory. Their long-standing track record in innovating specialized processes prevents other companies from entering the memory chip market efficiently due to the huge investment required. This along with cheaper labor, logistics, and better vertical integration in Asia makes a company like SK Hynix pretty well-entrenched in its area of business. While it does face strong competition with Samsung, supply and demand dynamics work well for memory chip players given its upstream importance in the supply chain, and the relatively low number of big producers in the segment.

The AI value chain at-a-glance: Spotlight on the memory chip segment



* Indicates a company primarily in Asia

Above: Overview of selected company placements in the AI value chain and Porter's Five Forces snippets for the Memory Chip segment.

As for the technology space in Asia, the memory chip segment adds to the many reasons why an astute investor may want to invest in Asia. The memory chip space can be seen as a component of the overall opportunity there is to realize in AI, which brings a boon to a much wider supply chain than what might be immediately apparent. Of course, no opportunity comes without risk factors, like competition in innovation, macroeconomic trends, and geopolitics. For one thing, as fabrication processes evolve, and chip architectures become more advanced, idiosyncratic risk may manifest with a specific chip manufacturer if it focuses too much effort and resources on fab processes and products that inadequately reach the bleeding edge of technology. For another, chip manufacturers regardless of specialization,

need to pay close attention to their business affairs from the pace of research and development (R&D) to the delivery contracts they have with downstream clients. Lastly, geopolitical trends like U.S.-China tensions may present unwanted intervention that interfere with business prospects, such as export bans and tariffs. This trend comes as governments around the world jostle to build their own chip-making and AI capabilities within their own shores.

Despite these risks, the demand for AI remains, and the need for hardware providers in this space stays, if not accelerates. It is truly a time for exciting innovation and evolution—and as it looks, Asia stands to benefit from these trends.

Risk considerations

Past performance is no guarantee of future results. Investing involves risk, including possible loss of principal.

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