The Rise of ASICs: A Golden Opportunity for Taiwanese Firms

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CSPs are increasingly developing custom chips (ASICs) to break free from NVIDIA's high-cost, general-purpose GPUs. This strategic shift is driven by a desire for cost savings, power efficiency and competitive differentiation. Taiwan's technology ecosystem is well-positioned to capitalize on this trend due to its established leadership in semiconductor fabrication and related services.

By Cathay SITE

The Taiwan Stock Exchange (TAIEX) has recently experienced a significant surge, with its market capitalization surpassing NT$80 trillion (approximately US$2.62 trillion) on September 9th and climbing into the top 10 largest stock markets globally, according to Market Cap Watch website. This rally is attributed to a confluence of factors, including robust global AI demand, foreign capital inflow, optimistic market sentiment and strong economic fundamentals.

Taiwan's economic data provides a solid foundation for the market's performance. The country's total exports reached a new single-month record of US$58.49 billion in August, overtaking South Korea's for the first time ever. Electronic component and information, communications, and video/audio exports accounted for nearly three-quarters of this total, with a 34.1% year-on-year increase.

The Rise of ASICs

Taiwan's export surge was driven by rising demand for semiconductors to power the repidly expanding AI industry. At the heart of this "AI gold rush" is a massive capital expenditure by Cloud Service Providers (CSPs) and major tech companies, who are pouring billions of dollars into creating custom chips (ASICs) tailored to their specific needs. This trend is not only reshaping the global AI chip market's power dynamics but is also creating unprecedented opportunities for Taiwan's technology sector, particularly in the ASIC design and manufacturing ecosystem.

Historically, NVIDIA's general-purpose GPUs dominated the AI training market, establishing a near-monopoly. However, NVIDIA's high gross profit margins—reaching 70% to 80%—have spurred cloud giants like Google and Meta to develop their own chips. Their goal is to cut costs and reduce reliance on a single supplier. This "build-it-yourself" strategy is fundamentally about pursuing ultimate performance and efficiency while saving billions of dollars in operational expenses.

From "Buying Products" to "Buying Services"

In this war for AI ASICs, a key distinction has emerged between the traditional American powerhouses (like Broadcom and Marvell) and the rapidly rising Taiwanese firms (like Alchip and MediaTek). The American firms primarily offer highly integrated "products," while the Taiwanese firms have thrived with a flexible "service" model.

The core of this conflict lies in the customer's changing needs—from "buying products" to

"buying services." As customers' in-house chip design teams mature, they no longer need a complete product. Instead, they require a top-tier "service" partner to help with the most challenging tasks, such as back-end physical implementation and mass production management. Taiwan's technology ecosystem is well-positioned to capitalize on this trend due to its established leadership in semiconductor fabrication and related services.

- **Design and Turnkey Services:** Certain Taiwanese companies are at the forefront of this trend. They provide turnkey services, which are critical for transforming a client's design blueprints into a manufacturable, precision-engineered product. The close partnership between these Taiwanese design service providers and hyperscalers demonstrates that such companies are crucial partners for hyperscalers in developing complex, high-performance chips.
- **Innovator's Dilemma:** Today's hyperscale data centers, with their own world-class design teams, now seek "service partners" to help them implement their designs rather than expensive "product suppliers." This shift has created an opening for agile competitors, as some incumbent's existing profitable business model hinders their ability to adapt to this disruptive new market.
- **Dual-supplier Strategy**: By becoming a second design partner for a client's next-generation product, this involvement highlights a common "dual-supplier" strategy among major clients. This approach aims to enhance bargaining power, diversify supply chain risks, and foster technical innovation.
- **Technological Leadership:** Regardless of which IC design house wins in this competitive landscape, Taiwanese companies stand to benefit. This is not only true for the dominant foundry TSMC, which is integral to the production of these advanced chips, but also for other electronic component manufacturers. These firms, already a part of NVIDIA supply chain, are also poised to benefit from the surging demand for ASICs.

Market Outlook and Risks

While the AI boom has driven phenomenal growth, the market faces short-term cyclical risks. Large-scale capital expenditures could lead to a "digestion period" or "gap year" in the next year or two. However, the explosive growth of end-user applications like generative AI for images and videos provides a strong long-term foundation for the market.

It's important to note that the higher NVIDIA's profits are, the stronger the incentive for its largest customers to develop alternative ASICs. Having said that, the two models are not mutually exclusive. The future will likely be a hybrid environment. CSPs will continue to rely on NVIDIA's GPUs for research and development of new models that require high flexibility. Meanwhile, they will deploy their custom ASICs for mature, high-traffic applications where cost is a critical factor.

Overall, Taiwan's core position in the AI chip supply chain is solidifying. By leveraging its strengths in advanced manufacturing processes, design services, and back-end production, Taiwanese companies have become indispensable partners for global tech giants in their AI strategies. This AI-driven industrial revolution is unlocking immense golden opportunities for Taiwan.

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