

# The Bottleneck Beneath AI: The Opportunity in Taiwan's Component Stack and the Local Specialist Edge

White Paper  
October 15, 2026



## SUMMARY

The artificial intelligence (AI) narrative is often dominated by its most visible layers: the models that people interact with day-to-day and the hyperscalers that train and serve them. Underneath all this sits a stack of components that AI cannot run without, most of which are manufactured in emerging markets. Notably, these components comprise AI's most meaningful choke point—creating an undeniable investment opportunity for those willing to take a look.

The bottleneck for the AI component stack rests on a single structural driver: growing demand set against constrained supply. The scale of the AI buildout has pushed demand far beyond the industry's ability to expand supply—a mismatch that has become so pronounced that even a meaningful demand slowdown would be unable to close the gap. Indeed, available supply is effectively spoken for, with nearly all capacity already contracted through the foreseeable future. This imbalance underpins the investment case, which is further reinforced by a healthy and predictable earnings outlook.

Accessing this opportunity, however, is more nuanced than it appears. While most of the AI component stack passes through Taiwan in some capacity, investors have mainly concentrated their attention on Taiwan Semiconductor Manufacturing Company (TSMC), the best-in-class mega-cap chip manufacturer. Although this attention is well-earned, there is a broader ecosystem of companies with distinct operating dynamics and supply constraints that are broadly overlooked despite playing an equally essential role in the AI buildout. This lack of recognition creates greater scope for market inefficiencies that, when navigated correctly, can translate into meaningful alpha opportunities. In such a market, local specialists display a clear edge, providing the best way to this opportunity and deliver differentiated returns.

## KEY HIGHLIGHTS

- **The AI Component Stack: A Structural Opportunity.** AI demand already exceeds the available supply of components to power it, and this demand continues to rise. While the pace of demand may slow, supply remains highly constrained and new capacity takes years to build, sustaining the opportunity for the foreseeable future.
- **Taiwan: The Most Critical Node in the AI Supply Chain.** Decades of participation in successive technology cycles have made Taiwan a textbook agglomeration economy, and a critical hub for the AI buildout. A significant portion of the AI component stack passes through the island in some shape or form.
- **Beyond TSMC: Inside the AI Component Stack.** At the center of Taiwan's AI universe is TSMC, the semiconductor giant. However, there is a large universe of Taiwanese AI components beyond TSMC with their own company-specific dynamics that also present compelling investment opportunities.
- **From Inefficiency to Alpha: The Local Specialist Edge.** The opportunity in Taiwan lies not only in identifying the right companies, but also in navigating the market's many inefficiencies. Dedicated specialists with a local presence are best positioned to turn those inefficiencies into alpha.



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## I. THE AI COMPONENT STACK: A STRUCTURAL OPPORTUNITY

The opportunity in the AI component stack is best defined by its key structural driver: a supply and demand mismatch.

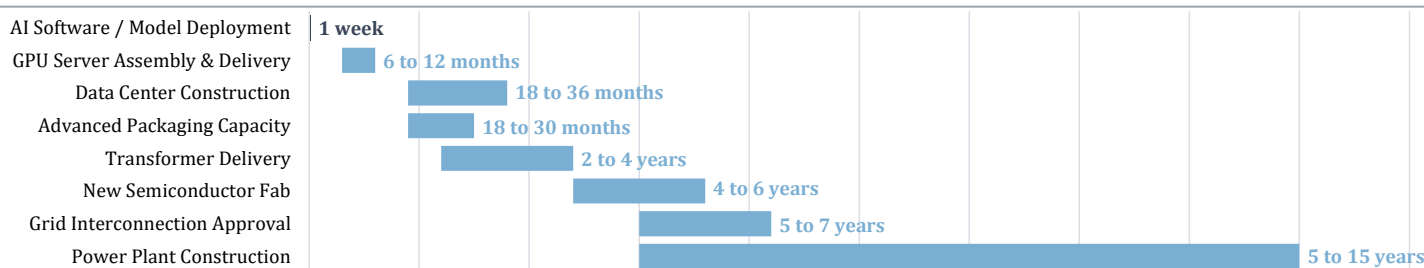
Demand for AI is essentially demand for compute (i.e., the processing ability required to train and run AI models). Powering this compute is a complex physical infrastructure made up of distinct components, meaning that demand for compute drives demand for the components. This demand has consistently grown faster than the supply of components can expand, creating a structural imbalance for the entire AI buildout. Most importantly, this imbalance persists regardless of how the AI race unfolds—no matter where data centers are built, how models are monetized or deployed, or which companies and countries ultimately lead the buildout, the underlying need for physical infrastructure will remain. Even if we see a slowdown in AI demand, today's supply constraints are too significant for this gap to close anytime soon. Furthermore, a slowdown would not fall evenly across the AI component stack, with layers that are still early in their adoption curves expected to continue growing on rising penetration alone.

Supply, on the other hand, is constrained by two primary factors. First, much of the capacity expected to come online over the next several years is already contracted, leaving little incremental supply available to meet additional demand. Order books already point to demand running at close to double the pace of supply growth, causing hyperscalers who are unable to secure sufficient allocations to pre-commit capital and pay premium prices to lock in capacity. Second, expanding capacity is a slow and complex process, with manufacturing capabilities taking months, years, or even decades to develop and bring online.

As such, supply is effectively fixed for the foreseeable future while rising demand—no matter the speed—continues to widen the gap.

### Expanding Capacity is a Slow and Complex Process

Lead Time to Build AI Infrastructure



Source: Grand Alliance Asset Management estimates as of August 31, 2026. NVIDIA supply chain disclosures, Wood Mackenzie, BofA Global Research, PJM Interconnection, TSMC official disclosures. Graph is presented for illustrative purposes only and should not be relied on to make an investment decision.

With most available supply already contracted, along with highly limited incremental capacity, AI component suppliers have a clear line of sight into future volumes, utilization, and pricing—all of which creates unusually strong earnings visibility. ABS's Taiwan Specialist has revised its earnings-growth estimates for the largest stocks in Taiwan to +73% for 2026 and +26% for 2027, up from +56% and +22%, respectively, just one quarter earlier.<sup>1</sup> Given that the AI component stack accounts for the bulk of these companies, these figures provide a useful proxy for the ecosystem itself. Therefore, the market's recent re-rating has been supported by significant upward earnings revisions and not multiple expansion alone. With earnings still expected to grow strongly in 2027, and the market's PEG ratio still below 1x, there continues to be room for further valuation upside.<sup>2</sup>

### Earnings Growth Looks Robust for the Taiwanese AI Component Stack

Calendar Year Earnings Growth (YoY)



Source: Grand Alliance Asset Management (GAAM) in house estimates as of August 31, 2026. Graph is presented for illustrative purposes only and should not be relied on to make an investment decision.



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## II. TAIWAN: THE MOST CRITICAL NODE IN THE AI SUPPLY CHAIN

The AI component stack spans hundreds of companies across a decades-old supply chain. Across that supply chain, one common thread stands out: Taiwan.

Taiwan's capabilities long predate the AI boom, with a technology industry developed through decades of investment and advancement across the personal computer (PC), smartphone, and cloud eras. The result is a highly efficient and deeply established ecosystem that has produced a textbook agglomeration economy. Taiwan's Hsinchu Science Park, the island's premier high-tech industrial park, houses more than 600 companies and 180,000 workers in *merely* 6.86 square kilometers.<sup>3</sup> Major AI component companies are therefore located within minutes of one another—and mostly within minutes of TSMC's headquarters. Such a density creates powerful agglomeration effects as suppliers and customers reinforce one another, accelerating innovation, improving efficiency, and deepening expertise across the ecosystem. This is all compounded by the abundance of talent in the field: More than one in three higher-education students in Taiwan are enrolled in a STEM field versus roughly one in four graduates across the OECD.<sup>4</sup> Over time, these advantages have developed significant competitive moats, making a similar ecosystem increasingly difficult to replicate elsewhere. Indeed, even as competitors attempt to build capacities elsewhere, new facilities take years, sometimes even decades, to come online and often remain reliant on Taiwanese talent and inputs. Meanwhile, Taiwan's ecosystem continues advancing with each new wave of technology and further extends its lead.

Such a strong ecosystem has meant that essentially the entire AI component stack ultimately runs through Taiwan in some shape or form. Most components are manufactured on the island, but even those that are produced elsewhere most likely pass through the island for assembly, testing, packaging, or other critical stages of production at some point as well. Notably, Korean memory chips, US-designed CPUs, and American networking hardware are all brought to Taiwan to be integrated with the rest of the component stack. This arguably makes Taiwan the most critical node in the AI supply chain, and a natural place to look for investment opportunities within the theme.

### Taiwan Dominates the Global AI Component Stack

Leading Global AI Supply Chain Companies by Country

|                                 | Taiwan                                         | US                              | Korea             | Japan     | China                              |
|---------------------------------|------------------------------------------------|---------------------------------|-------------------|-----------|------------------------------------|
| Components                      | 41                                             | 12                              | 4                 | 3         | 3                                  |
| Foundry / OSAT / Semi Equipment | TSMC, UMC, ASE, KYEC, Hongjin                  | Amkor, Intel                    | Samsung           |           | SMIC, Hua Hong                     |
| Testing Equipment / Probe Card  | Hon Precision, CHPT, MPI, WinWay, KSMT, Chroma | Teradyne                        |                   | Advantest |                                    |
| Networking                      | Accton                                         | Arista, Cisco, Astera Labs      |                   |           |                                    |
| PCB / BMC                       | Gold Circuit, Tripod, Unimicron, ASPEED, WUS   | TTM                             | ISU, Semco        |           | Dongshan Precision                 |
| Heat Dissipation (Chip-Level)   | Jentech, i-Chiun, AVC, CoolerMaster, Delta     |                                 |                   |           |                                    |
| Heat Dissipation (Rack-Level)   | Auras, CoolerMaster, Kaori, Delta, LiteOn      | Vertiv, Motivair                |                   |           |                                    |
| GPU Module ODMs                 | Wistron, FII                                   |                                 |                   |           |                                    |
| Substrate                       | Unimicron, Nanya PCB, Kinsus                   |                                 |                   | Ibiden    |                                    |
| Signal Cable                    | BizLink                                        | Amphenol, Molex                 |                   |           |                                    |
| CCL                             | ITEQ, EMC, TUC                                 |                                 | Doosan            | Panasonic |                                    |
| Power Supply                    | Delta, LiteOn                                  | Flex Power                      |                   |           |                                    |
| Other Components                | Kingslide, Yageo, Lotes                        |                                 |                   |           |                                    |
| Chips                           | 3                                              | 8                               | 2                 | 0         | 4                                  |
| GPU                             |                                                | NVIDIA, AMD                     |                   |           | Cambricon, Moore Threads           |
| ASIC                            | GUC, Alchip, MediaTek                          | Broadcom, Marvell               |                   |           |                                    |
| Memory                          |                                                | Micron, SanDisk                 | SK Hynix, Samsung |           | CXMT, YMTC                         |
| CPU                             |                                                | Intel, AMD                      |                   |           |                                    |
| Assemblers                      | 7                                              | 2                               | 0                 | 0         | 1                                  |
| Server ODMs                     | Wiwynn, Wistron, Quanta, FII, Inventec         |                                 |                   |           |                                    |
| PC Brand                        | Asus, Acer                                     | Dell, HP                        |                   |           | Lenovo                             |
| End Customers                   | 0                                              | 8                               | 0                 | 0         | 5                                  |
| CSP / DSP                       |                                                | Microsoft, Google, Meta, Amazon |                   |           | Alibaba, Tencent, ByteDance, Baidu |
| Server Brand                    |                                                | Dell, HPE, IBM, SuperMicro      |                   |           | Lenovo                             |
| Grand Total                     | 51                                             | 30                              | 6                 | 3         | 13                                 |

Source: Grand Alliance Asset Management as of September 30, 2026. Companies active in more than one category are counted in each. This chart lists the key players in each segment and is not meant to be exhaustive. Chinese companies are included as leading players in their categories, though many primarily supply the domestic market and do not yet compete directly with Taiwanese companies globally. Graph is presented for illustrative purposes only and should not be relied on to make an investment decision.



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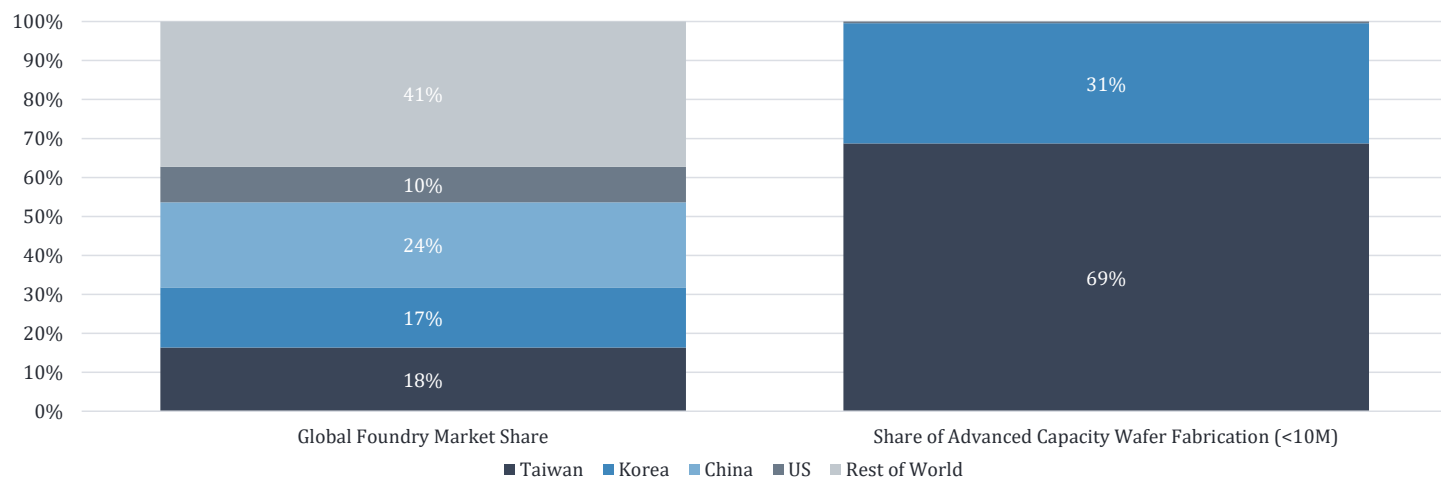
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## Taiwan Makes 69% of the World's Most Advanced Chips

Market Share per Country



Source: Semiconductor Industry Association and BCG Report "Emerging Resilience in the Semiconductor Supply Chain" published in May 2024. Data as of 2022. Graphs are presented for illustration purposes only and should not be relied on to make an investment decision. Past performance is not a guarantee of future results.

### III. BEYOND TSMC: INSIDE THE AI COMPONENT STACK

At the center of Taiwan's AI ecosystem sits TSMC, the world's dominant manufacturer of advanced semiconductor chips. TSMC's chips perform the massive computations required to train and run AI models, which has made the company's role in the AI buildout difficult to overlook. Indeed, TSMC has already appreciated ~320% since January 1, 2024,<sup>5</sup> and with capacity for its most advanced chips already booked through 2028 and utilization at its leading-edge facilities running near 100%,<sup>6</sup> the opportunity seems far from over.

Despite its central role, a TSMC chip does little on its own. Instead, it depends on the rest of the AI component stack—packaging, substrates, boards, modules, power delivery, cooling testing, and the interconnects that tie them together—to translate raw compute into usable AI performance. These other components represent a myriad of distinct opportunities, each deserving consideration. In many cases, bottlenecks may be even tighter than those in semiconductors, and these constraints are not static: As new capacity comes online in one layer, undersupply can shift elsewhere in the chain, and so forth. Identifying which story looks most compelling requires continuous analysis of each individual component—a difficult task given the breadth of the stack, the number of moving parts, and how quickly supply-demand dynamics can change.

The best way to identify these opportunities is to break the AI component stack down layer by layer. Today, several layers are entering cyclical upturns, the phase of the industry cycle in which tightening supply meets recovering or accelerating demand. This pushes up utilization, component prices, and expands margins. ABS's Taiwan Specialist currently sees this most clearly in ABF substrates, copper-clad laminate (CCL), and select multilayer ceramic capacitors (MLCC). Companies whose AI-related businesses are only beginning to ramp have also grown more attractive, particularly within the ASIC and optical supply chains, where the market has yet to price in the scale of what is coming. The latest earnings season sharpens this component-by-component view, and the table below summarizes the landscape layer by layer.



## Taiwan's AI Component Stack at a Glance

Market Share, Key Suppliers and ABS Taiwan Specialist Outlook by Component

| Component                    | Role in the AI Server                                                        | Taiwan's Global Share                                                                                                                                        | Key Taiwanese Suppliers                                                                                                                     | Relative Outlook vs. Rest of AI Component Stack |
|------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Foundry                      | Fabricates the leading-edge logic chips (GPUs, ASICs)                        | ~75% of global foundry revenue (TSMC alone ~72-73%; UMC adds ~4%)                                                                                            | <ul style="list-style-type: none"> <li>TSMC</li> <li>UMC (legacy nodes)</li> </ul>                                                          | Neutral                                         |
| Advanced Packaging (CoWoS)   | Integrates logic die and HBM on an interposer; the key capacity bottleneck   | ~80-90% of global AI advanced packaging capacity (TSMC dominates CoWoS; ASE/SPIIL contribute additional capacity)                                            | <ul style="list-style-type: none"> <li>TSMC</li> <li>ASE, KYEC (OSAT)</li> </ul>                                                            | Positive                                        |
| Substrates                   | ABF board the package sits on; routes power and signal to the PCB            | ~35-40% of global ABF substrate capacity (Japan leads the space)                                                                                             | <ul style="list-style-type: none"> <li>Unimicron, Nanya PCB, Kinsus</li> </ul>                                                              | Positive                                        |
| GPU Module ODMs              | Assembles the GPU module (package, cooling and board)                        | ~80-90% of global AI GPU module assembly                                                                                                                     | <ul style="list-style-type: none"> <li>Wistron, FII</li> </ul>                                                                              | Negative                                        |
| Cooling — Chip Level         | Heat spreader or cold plate sitting directly on the die                      | ~60-70% of AI server cold plate / thermal solution supply chain                                                                                              | <ul style="list-style-type: none"> <li>Jentech, I-Chiun (heat spreaders)</li> <li>AVC, Cooler Master, Delta (cold plates)</li> </ul>        | Positive                                        |
| Circuit Boards (PCB/CCL/BMC) | Board carrying the modules; CCL is its core laminate; BMC manages the server | ~50-60% of high-end AI server PCB supply; 70%+ for BMC (ASPEED essentially dominates server BMC)                                                             | <ul style="list-style-type: none"> <li>Gold Circuit, Tripod, Unimicron (PCB)</li> <li>ITEQ, EMC, TUC (CCL)</li> <li>ASPEED (BMC)</li> </ul> | Positive                                        |
| Server ODMs                  | Assembles full servers and racks from boards and modules                     | 90%+ of global AI server manufacturing                                                                                                                       | <ul style="list-style-type: none"> <li>Wiwynn, Wistron, Quanta, FII, Inventec</li> </ul>                                                    | Negative                                        |
| Power Supply (PSU/HVDC)      | Converts grid power for the racks; shifting to rack-level HVDC               | ~70% of AI server PSU market                                                                                                                                 | <ul style="list-style-type: none"> <li>Delta, Lite-On</li> </ul>                                                                            | Positive                                        |
| Cooling — Rack Level         | Manifold and CDU circulating coolant across the rack                         | ~60-70% of liquid-cooling infrastructure supplied by Taiwanese vendors                                                                                       | <ul style="list-style-type: none"> <li>Auras, Cooler Master, Kaori (manifolds)</li> <li>Delta, Lite-On (CDUs)</li> </ul>                    | Positive                                        |
| Probe Cards & Testing        | Interfaces and equipment that validate chips                                 | ~20-30% of advanced AI test interface market                                                                                                                 | <ul style="list-style-type: none"> <li>Hon Precision, CHPT, MPI, WinWay, KSMT, Chroma</li> </ul>                                            | Positive                                        |
| Other (Rail, MLCC, Sockets)  | Mechanical and passive parts that hold the system together                   | <b>Rail:</b> ~70-80% – Kingslide dominates high-end AI server rails<br><b>Server Sockets:</b> ~60-70% in high-end server CPU sockets<br><b>MLCC:</b> ~15-20% | <ul style="list-style-type: none"> <li>Kingslide (rails)</li> <li>Yageo (MLCC)</li> <li>Lotes (sockets)</li> </ul>                          | Positive on rail<br>Mixed on MLCC and socket    |

Source: Grand Alliance Asset Management as of September 30, 2026. Investment team estimates. Graph is presented for illustrative purposes only and should not be relied on to make an investment decision.

## IV. FROM INEFFICIENCY TO ALPHA: THE LOCAL SPECIALIST EDGE

The opportunity in Taiwan extends beyond identifying the right AI components and the right companies; it also lies in navigating the market inefficiencies that surround them. Local specialists are particularly well positioned to capitalize on these inefficiencies, creating a differentiated source of alpha.

Taiwanese companies report monthly and often only in Chinese. This makes speed of interpretation especially important, and while translation tools have improved, they still cannot fully replicate the speed and nuance of a native speaker. Local specialists therefore have an inherent advantage in processing this frequent flow of information and incorporating new developments into their investment views.

Even for investors able to overcome the language barrier, the sheer breadth of Taiwan's AI component universe presents another challenge. The technology and industrial sectors in Taiwan span more than 500 companies, requiring a dedicated research effort to cover the opportunity set in sufficient depth.<sup>7</sup> Local specialists have a clear advantage here as well: Their exclusive focus on Taiwanese equities allows them to segment the market, follow a much broader set of companies, and develop a level of company- and industry-specific knowledge that is difficult for more generalized investors to replicate.

In most markets, investors might compensate for this research burden by relying on external research. In Taiwan, however, sell-side coverage is exceptionally thin. More than 50% of the market has no sell-side coverage at all, while another 25% is only lightly covered.<sup>8</sup> As a result, meaningful research across nearly 80% of the market must largely be conducted in-house—a resource-intensive undertaking that few investors outside of dedicated local specialists are equipped to support.



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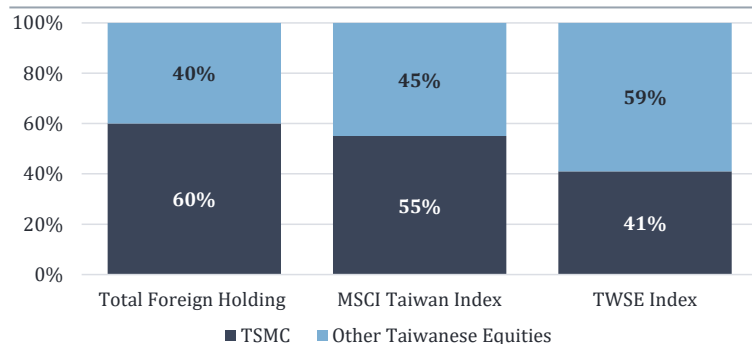
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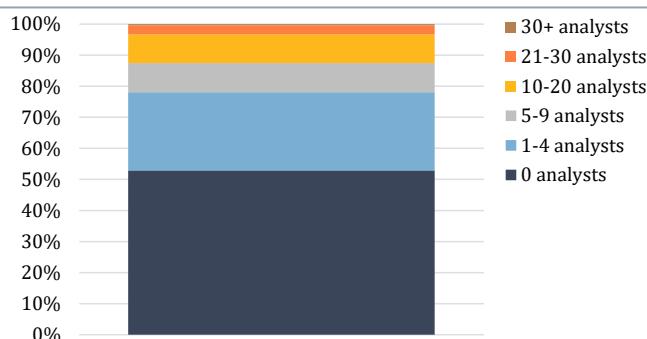
## TSMC Accounts for Majority of Foreign Ownership in Taiwan

Foreign Ownership of Taiwanese Equities



## Over Half of Taiwan's AI Plays Have Zero Analyst Coverage

Number of Analyst Recommendations per Stock



Source: Bloomberg as of August 31, 2026. Foreign ownership reflects ownership of the Taiwan TAIEX index and TSMC. Number of analyst recommendations on industrial and technology sector stocks in the Taiwan TAIEX index. Graph is presented for illustrative purposes only and should not be relied on to make an investment decision.

The result is a market where investors often concentrate their attention on the largest and most familiar names, particularly TSMC. Indeed, TSMC accounts for roughly 60% of foreign holdings in Taiwanese equities, compared with a 55% weight in the MSCI Taiwan Index.<sup>9</sup> That concentration can leave opportunities elsewhere in the market underfollowed and underrecognized, especially in the smaller names that constitute Taiwan's AI component stack—which is precisely where local specialists tend to find hidden alpha.

These local specialist advantages are reinforced by the differentiated access that comes with their boots-on-the-ground approach. A sustained local presence allows them to build longstanding relationships across company management teams, suppliers, industry participants, and policymakers. Over years, and in some cases decades, these networks can provide valuable context around changing industry conditions, helping local investors develop differentiated insights and identify inflections before they become broadly recognized.

## CONCLUSION

AI cannot run without its physical component stack, and that stack cannot be built fast enough to meet increasing demand that far exceeds supply today. With all the current capacity already spoken for, it will take years or even decades to add new supply. This is an imbalance that is expected to hold even if the pace of the AI buildout slows. This creates a compelling investment opportunity, one that is well expressed in the Taiwanese equity market given its central role in the AI supply chain. Although essentially the entire AI component stack passes through the island, investor attention has mostly settled on TSMC alone, leaving many other equally essential companies thinly covered and inefficiently priced. This neglect is the opportunity, but capturing this requires overcoming tough hurdles in a market built for investors with local knowledge, putting on-the-ground specialists in the strongest position to unlock significant value from what should be a theme for many years to come.

## DISCLOSURES

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<sup>1</sup> Bloomberg, Grand Alliance Asset Management as of August 31, 2026.

<sup>2</sup> Bloomberg, Grand Alliance Asset Management as of August 31, 2026.

<sup>3</sup> NSTC as of August 2026. <https://wsts.nstc.gov.tw/stsweb/sciencepark/ScienceParkReport.aspx?language=C&quid=tqemployees01>



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- <sup>4</sup> Taiwan Ministry of Education, Department of Statistics as of October 15, 2024. [https://stats.moe.gov.tw/files/analysis/113\\_all\\_level.pdf](https://stats.moe.gov.tw/files/analysis/113_all_level.pdf). OECD as of 2023. [https://www.oecd.org/en/publications/education-at-a-glance-2025\\_1c0d9c79-en/full-report/how-do-student-profiles-study-choices-and-mobility-trends-shape-tertiary-education\\_97e1e2bd.html](https://www.oecd.org/en/publications/education-at-a-glance-2025_1c0d9c79-en/full-report/how-do-student-profiles-study-choices-and-mobility-trends-shape-tertiary-education_97e1e2bd.html).
- <sup>5</sup> Bloomberg as of September 30, 2026.
- <sup>6</sup> Grand Alliance Asset Management as of September 30, 2026. Investment team estimates.
- <sup>7</sup> Taiwan TAIEX Index as of August 31, 2026. Companies listed in the industrial and technology sectors.
- <sup>8</sup> Bloomberg as of August 31, 2026. Number of analyst recommendations on industrial and technology sector stocks in the Taiwan TAIEX index.
- <sup>9</sup> Bloomberg, Taiwan TAIEX Index, and MSCI Taiwan Index as of August 31, 2026. Foreign ownership reflects ownership of the Taiwan TAIEX index and TSMC.

