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## **Cross-Strait Tensions: A Potential Motivation for South Korea Joining CHIP 4**

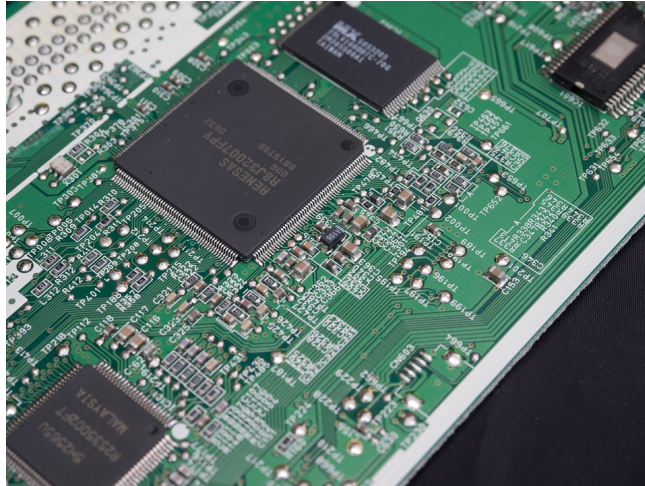
*Hu Xinyue*

### **SYNOPSIS**

*Semiconductors are becoming increasingly important in security and commercial applications, making them a critical arena for both the United States and Mainland China. Despite its significant economic dependence on Mainland China, South Korea recently joined the US-led CHIP 4 Alliance, further escalating the technology competition between the two great powers. **HU XINYUE** analyses how South Korea views the CHIP 4 membership as an opportunity to position itself as a reliable alternative for global orders from the US and its allies amidst heightened cross-strait tensions and evaluates the ramifications of South Korea's decision.*

### **COMMENTARY**

The US, with its [robust](#) capabilities, excels in the [upstream](#) stages of the semiconductor supply chain, forming the backbone of the industry under a system known as "[Wintelism](#)", where technology standards are open but predominantly controlled by the US. The [Biden](#) administration has proposed the CHIP 4 Alliance, a strategic partnership among key players including itself, Japan, Taiwan, and South Korea to reduce their dependence on [China](#), a potential geopolitical adversary of the US. Following this proposal, South Korea [confirmed](#) its participation in the US-led grouping. Indeed, South Korea's fear of being overshadowed by Taiwan's semiconductor industry has significantly shaped its decision.



South Korea recently joined the US-led CHIP 4 Alliance as a means to position itself as a trustworthy alternative to the US and its allies amidst heightened cross-strait tensions, though this decision may see South Korea facing short-term losses from their Chinese market. *Image from Pixabay.*

## South Korea's Semiconductor Market Outperformed by Taiwan

According to statistics, China is the [largest](#) importer of South Korean microchips, with almost [70%](#) of South Korea's chip exports directed to Mainland China and Hong Kong, far exceeding other destinations. Notably, despite its heavy economic dependence on China, South Korea joined the US-led CHIP 4 Alliance, establishing itself as a US ally in the technology rivalry and potentially against Mainland China.

However, the move should be seen as an effort by South Korea to align itself symbolically with the US as an ally, rather than a genuine attempt to contain Mainland China, given South Korea's relatively limited influence in the semiconductor supply chain.

South Korea has long been struggling to compete with Taiwan in global chip manufacturing. In advanced manufacturing, Taiwan, another CHIP 4 member, holds a crucial advantage over South Korea. Notably, Taiwan maintains its technological [dominance](#) in terms of the market shares of semiconductor manufacturing, with the global market relying [heavily](#) on Taiwan's cutting-edge manufacturing capability for a wide range of industries, including defence and automotive. The Taiwan Semiconductor Manufacturing Company (TSMC), the world's [largest](#) foundry, dominates the high-end microchip market with more than [90%](#) of the global market share. In the first quarter of 2024, TSMC held [61.7%](#) of the global semiconductor foundry market, while Samsung, Korea's leading semiconductor manufacturer, accounted for just [11%](#).

Additionally, South Korea lags behind Taiwan in terms of the advancement of semiconductor manufacturing technology. For instance, in the field of advanced 3nm fabrication technology, South Korea's [Samsung](#), though initially taking the lead, faces challenges in addressing [manufacturing issues](#), resulting in substantial order losses. Contrastingly, Taiwan's TSMC [remains](#) a market leader with exceptional operational performance.

## **Cross-Strait Tensions Creating Opportunities for South Korea**

The impending crisis between Mainland China and Taiwan is increasing the collateral risks of Taiwan's semiconductor industry falling under Beijing's control, especially after [Chinese president Xi Jinping](#) highlighted China's determination to employ "all necessary means" and emphasised the "inevitability" of reunification. Such a scenario could inadvertently increase US dependence on a potential geopolitical adversary, posing fundamental threats to national security of the US and its allies. Supply chain disruptions or restricted access to these crucial components could also increase, severely impacting the US' economic stability, technological leadership, and national security.

However, the escalating tensions between Mainland China and Taiwan are perceived by South Korea as an unprecedentedly lucrative opportunity that they have been unable to fully capitalise on due to the inherent characteristics of the semiconductor industry.

For instance, top South Korean semiconductor company Samsung, which is an Integrated Device Manufacturer (IDM) involved in both semiconductor design and production, found itself at a disadvantage compared to TSMC, which solely focuses on manufacturing. [Analysis](#) shows that this disadvantage is primarily because of conflicts of interest between Samsung and their influential customers, such as US designers. Such inherent disadvantages of Samsung's business model cannot be easily diminished overnight and would require a more strategic approach. By joining the CHIP 4, South Korea is striving to establish itself as the safe and primary recipient of TSMC's lost deals in the long term.

### **Ramifications of South Korea's Decision**

Though the cross-strait issue is not likely to be resolved soon and Taiwan's future replacement remains unclear, short-term losses from the Chinese market seem tolerable.

South Korea's decision to join the US-led alliance has significantly strained its economic relations with China. Following the announcement of its intention to participate in the CHIP 4 meeting in [August 2022](#), Korea's exports of chips to China declined for [15](#) consecutive months, continuing through late 2023. Such a prolonged downturn has been rare in the over 30 years since Beijing and Seoul established diplomatic ties, with the worsened economic relationship posing a serious threat to South Korea's export-driven economy.

However, Mainland China's strength predominantly lies in the downstream supply chain, such as assembly, testing, and packing. That is why China still heavily relies on South Korea for the advanced manufacturing of DRAM chips, a technology that cannot be developed overnight. Indeed, South Korea's chip exports rebounded with a [12.9%](#)

surge in November 2023. [In July 2024](#), South Korea's exports grew at the fastest pace in six months, with semiconductor exports rising 50.4% for the ninth consecutive month.

Future policymakers should recognise that heightened tensions in the Taiwan Strait, while potentially a crisis, also present opportunities for countries to leverage globalisation by relocating and diversifying critical industries like the semiconductor sector. South Korea, for example, has strategically positioned itself to absorb the business lost by Taiwan at manageable costs.

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