

China Economic Update December 2022



US chips controls could constrain China's tech development goals

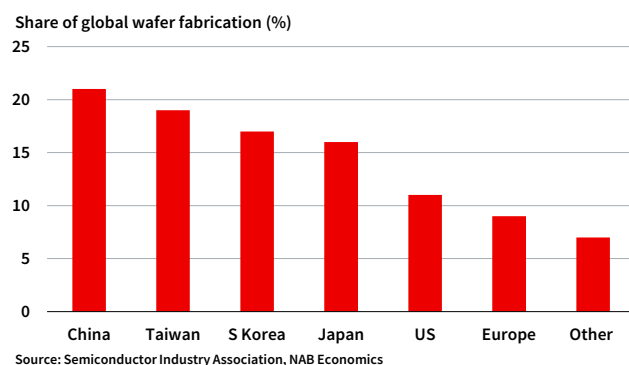
NAB Group Economics

Trade tensions between the United States and China have been ebbing and flowing for many years – culminating in the trade war between mid-2018 and early 2020. Although China's failure to meet the commitments outlined in the Phase One trade deal did not see a broad resumption of trade hostilities, recent US policy moves have sought to curtail China's technology sector which could constrain a key part of the country's planned economic development.

China's tech growth raised concerns in advanced economies

The "Made in China 2025" strategic plan aimed to push China's manufacturing higher up the value chain (offsetting the loss of competitiveness with lower cost, lower value-added producers in Asia). A particular focus of the plan was the development of high technology industries, including semiconductor manufacturing, with a goal of substantial self-sufficiency in the production value chain. This raised concerns globally – particularly in the United States and Europe – regarding national security, intellectual property and industrial and trade policies (with potential for Chinese subsidies and trade barriers to protect the domestic industry to the detriment of global competitors).

China leads global output... ...but Taiwan and South Korea dominate high end chip production



According to the Semiconductor Industry Association, the largest share of global wafer fabrication (the manufacturing process to produce integrated circuits) was conducted in China in 2021 (at around 21%), followed by Taiwan (19%), South Korea (17%) and Japan (16%). The United States accounts for a smaller share – around 11%. It is worth noting however that not all semiconductors are the same, with Taiwan and South

Korea dominating the production of the most advanced chips, while China has an outsized share of older legacy chips.

Concerns around China's growing influence in the global technology sector have been increasing for a number of years – culminating in the banning of major telecommunications equipment manufacturers Huawei and ZTE from various advanced economy 5G networks (including Australia in 2018).

In early 2021, reports suggested that several think tank white papers were circulating within the Biden Administration proposing alliances between liberal democracies that would support semiconductor research and development and strengthen supply chains between these countries while curtailing China's growth ambitions. These reports pointed towards a more multi-lateral and targeted response to China's failure to meet the commitments of the Phase One trade deal.

US moves to strengthen its semiconductor sector and weaken China's

In August 2022, President Biden signed the Creating Helpful Incentives to Produce Semiconductors and Science (CHIPS) Act, a US\$280 billion program to boost domestic semiconductor manufacturing capacity, support research and development of leading-edge technologies and ensure the supply of skilled labour to the sector.

This was followed by a series of controls published in early October by the US Department of Commerce that severely restrict trade and intellectual property transfers with China. Semiconductors made using US technology with potential use in artificial intelligence, high performance computing and supercomputers will

require an export licence to be sold to China – which will likely be difficult to receive.

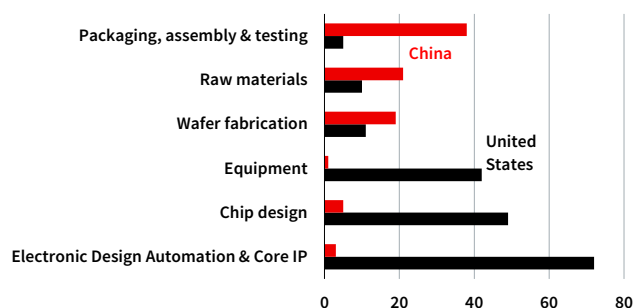
In addition, the rules restrict US citizens and green card holders, along with US firms, from working with Chinese semiconductor producers (without specific approval) – with the latter preventing the export of tools and equipment used to manufacture semiconductors. According to reports, the introduction of these rules led to the immediate resignations of US staff at Chinese producer YMTC, while US personnel at European chip makers stood down from tasks involving China.

Given the comparatively small share of US production – at least prior to any capacity increases associated with the CHIPS Act – it is the latter controls that are likely to have the largest impact on the supply of high-tech semiconductors to China. The US controls the dominant share of core intellectual property and design software and has large shares in semiconductor design and the production of manufacturing tools and equipment – key chokepoints in the global value chain. In denying access to these areas, China is unlikely to be able to produce high end chips or access them from other producers in Asia in significant quantities.

US share of semiconductor industry

US dominant in design and equipment

Share of global semiconductor activity (%)



Source: Semiconductor Industry Association, NAB Economics

Conclusions

At a high level, “Made in China 2025” was in part an acknowledgement that China needed to move higher up the manufacturing value chain as it was rapidly losing competitiveness to lower cost producers. Any measures that limit China’s capacity to make this transition will be a negative for its economic growth over the medium to longer term.

The full implications of the US restrictions will take time to emerge, however they are likely to have a significant negative impact on China’s high technology ambitions. According to the Center for Strategic and International Studies, US technologies are irreplaceable over the near to medium term, meaning that China will be effectively cut off from the leading-edge technologies. Various analysts have suggested that the Biden Administration’s

actions will have a far more substantial toll on China’s economy than the Trump Administration’s trade war.

However, it is worth noting that this is predicated on cooperation from allied countries. The US is reportedly working on developing and strengthening the so-called “Chip 4” alliance with Japan, South Korea and Taiwan as well as the US-EU Trade and Technology Council. It is worth noting that the sheer demand for high technology semiconductors in China could prove to be a lucrative grey market for firms or individuals willing to risk skirting US restrictions – despite the risk of sanctions if they were caught. That said, it seems unlikely that this would be sufficient to meet China’s needs.

It is possible that China could limit its exports of raw materials – such as rare earths – in response to these measures, however overall, the capacity of China to effectively retaliate is limited. That said, US measures are likely to lead to higher costs across the industry in the near term, as supply chains adjust away from China, which are likely to be passed on to end consumers.

There is also the potential – as outlined in the think tank papers – that global technology markets could become bifurcated between US aligned and Chinese aligned platforms. Were rival platforms unable to communicate with each other, then the costs of global business could rise.

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