Conclusions

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These conclusions are part of the report "Dutch semiconductor interests in Asia. The politicisation of the Asian semiconductor industry", which you can read here.

Based on the discussions in the country chapters, it is possible to draw a few general conclusions about the (geo)politicisation of the semiconductor industry in Asia and its impact on the Dutch sector, although doing so is challenged by the complexities of the semiconductor value chain. While the segments of this value chain are actually quite straightforwardly divided among different countries in the region, this nonetheless results in complicated fragmentations and relationships.

This complexity is illustrated by the fact that, according to some acconts, China is both the world's largest exporter and importer of semiconductors, while Chinese semiconductor companies capture only a relatively small market share. Such situations are possible because many companies only design chips and outsource the actual manufacturing to foreign manufacturers, which might in turn operate manufacturing plants in a third country. Who is then actually producing these semiconductors, and who is exporting them?

Moreover, despite public attention focusing on cutting-edge chips, there are many types of semiconductors. Less-advanced chips are also in high demand and indispensable. Despite these complexities, the following conclusions can be drawn, albeit cautiously.

The Asian semiconductor industry and politics

The Asian semiconductor industry has always been a theatre for politics. It was never a globalised free market and the US–China tech rivalry is only the latest example of politics affecting the industry. Historically, many governments in Asia, from Japan to Singapore, have played a very active role in supporting the development of the semiconductor sector in their country through investments, tax benefits and other encouraging measures. More recently, the governments of China and now also India have adopted such strategies as well. Such active government support predates the recent political priority that Washington gives to semiconductors. However, it is clear that the US Chips Act set in motion a new wave of investment plans by Asian governments to ensure that their industry does not fall behind.

Political relations between countries in the region have also already shaped the industry for many decades. For example, when the US industry and government felt threatened by the dominant position of the Japanese semiconductor industry in the 1980s, they pressured Tokyo to sign agreements that were unfavourable to Japanese companies. South Korean enterprises were, in turn, able to benefit from these conditions and began to take over Japan's market share in memory semiconductors. Much later, political friction over an unrelated historical issue between Seoul and Tokyo resulted in Japan restricting the export of semiconductor materials to South Korea, which in response invested in phasing out its dependence on Japan in the semiconductor industry. It appears that the nature of the semiconductor industry, which is crucial for modern technologies and whose value chain is fragmented among countries, has always made it susceptible to political intervention.

Moreover, the US–China tech rivalry, specifically in the semiconductor industry, is reshuffling the political relations between countries in Asia, as well as between the region and the Netherlands. Countries such as South Korea and Taiwan have for a long time quite successfully balanced Chinese and American pressure, which allowed them to benefit from China's economy and from the US in the area of security. They are now being pressured by Washington to pick their side more distinctly because of the US semiconductor blockade of China. Taipei and Seoul appear to be giving in, thus seriously deteriorating their relationship with Beijing.

Furthermore, relations between countries, which have sometimes historically been problematic, might become closer, both because of pressure from the US to collaborate on semiconductors and because of these countries' own interest to balance China's growing power in general. Japan and India have found one another in the Supply Chain Resilience Initiative, while the Chips 4 Alliance is enhancing coordination among Seoul, Tokyo and Taipei. India's role as a potential alternative to China is highlighted, as is Singapore as a relatively neutral space where Chinese and foreign players can continue to meet.

On the bilateral level, certain relations also appear to be improving, with the new administrations of Japan and South Korea seeking rapprochement, while Taipei and Tokyo are exploring the further expansion of Taiwanese semiconductor companies in Japan. The Netherlands and South Korea have sought to increase collaboration in the semiconductor sector in the face of the US–China rivalry. Recently, the Netherlands also seems to have coordinated with Japan, as both countries at the same moment appear to have signed onto the US plan to curb exports of semiconductor equipment to China.

Implications for Dutch interests in the Asian semiconductor industry

The Dutch semiconductor sector is highly connected with the industries of countries analysed in this study. Semiconductor equipment companies and chip producers from the Netherland have major customers in China, Taiwan, Singapore and South Korea, operate design and production facilities in India, China and Singapore and make use of Chinese and Taiwanese foundries. Several R&D facilities with connections to the Netherlands can also be found in the region, as well as links between universities in the area of semiconductors. These connections are shaped in various ways by the different political developments in the semiconductor industry in the region.

Obviously, the United States preventing other countries from supplying advanced semiconductors and equipment to China has negative consequences for the Dutch industry. ASML is barred by the Dutch government, under pressure from Washington, from shipping its most advanced EUV machines to China, and the same now appears to be true for the later versions of its less-advanced DUV machines. China was ASML's third-most important export market in 2021, and one with a large potential for growth, so this is a significant loss. The new US export restrictions introduced in October 2022 also impact Dutch companies. For example, ASM International (which earns 16 per cent of its revenue in China), expects that 40 per cent of its sales in China will be affected by the new restrictions.

Apart from the direct loss of revenue in the Chinese market, it is not impossible to imagine Beijing or indeed Chinese consumers retaliating against Dutch economic interest, in response to possible Dutch alignment with Washington's efforts to frustrate China's semiconductor development. Of course, this is not to say that the Dutch government should give in to such pressure, but it does emphasise that the Netherlands should remain focused on its own interests while facing demands from both sides. The United States and China certainly act in their own interest. It is obvious that the Netherlands would stand stronger against such pressures as part of the EU bloc, which questions the Dutch government's decision to negotiate with Washington bilaterally about joining the US restrictions on China.

However, these disadvantageous outcomes might be mitigated by other political developments. First, many Asian governments have recently committed themselves to invest extensively in strengthening their domestic semiconductor sector and to lessen dependencies. They do so in part to keep up with the large investments by Washington in the US semiconductor sector and because recent events have exposed the downsides of relying on overseas semiconductor production. For example, think of the supply chain issues exposed by the COVID pandemic, the supply chain risks associated with a potential reunification of Taiwan with China by military force, or the fact that South Korean and Taiwanese

companies are blocked by the United States from using advanced semiconductor equipment at their extensive manufacturing facilities in China. This convinces governments to attract domestic and foreign semiconductor companies to invest in production facilities within their country, something the United States is also looking to do through its Chips Act.

Such efforts often focus on increasing a country's chip manufacturing capacity, especially regarding advanced chips. This will result in more supply and possibly ultimately in overcapacity. This could challenge the profitability of any advanced chip manufacturing plant that the EU would like to see built in Europe, as well as the EU's stated goal to double its global market share in chip production.

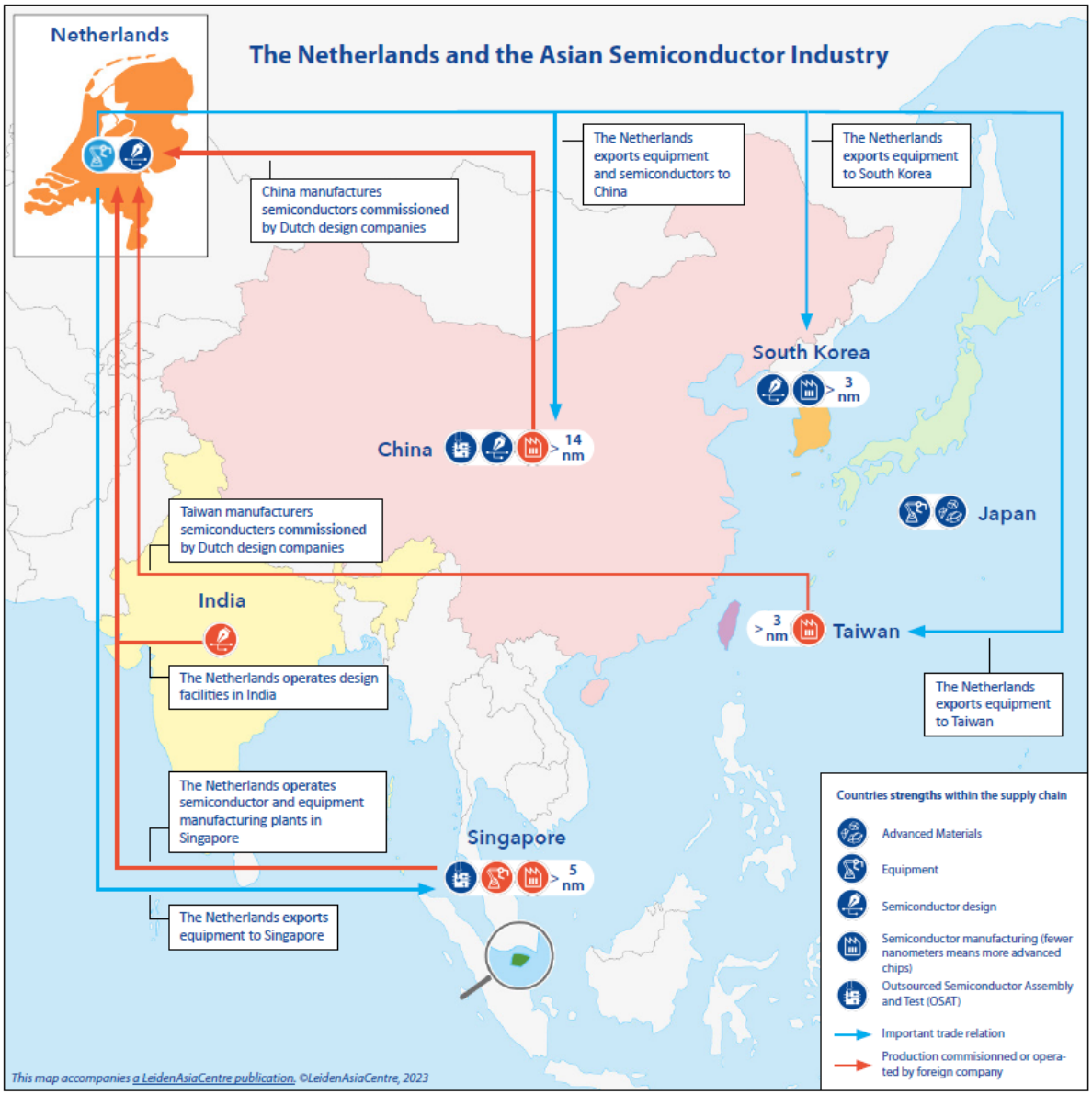
However, for Dutch equipment companies that can provide the necessary machines for these new plants, this mainly offers opportunities, at least in the short turn. The latest data from ASML, for example, show that the company's revenue continued to grow in 2022, despite its inability to sell EUV machines to China.[1] This is in part because large semiconductor manufacturers are building new plants across Asia (for example, Samsung in South Korea and Singapore, TSMC in Japan and the US, Foxconn in India and UMC in Singapore) and in the United States (Samsung and TSMC). ASML cannot keep up with demand: it has orders worth 40 billion euros still outstanding.

Some countries have also committed themselves to developing their semiconductor equipment industry. The South Korean government does so because it wants to decrease its dependence on Japanese equipment, while Japanese equipment companies want to strengthen their competitiveness. This does provide opportunities for Dutch R&D organisations that have expertise in this field. However, in the long run, increased investments by South Korean and Japanese companies could result in competition for the Dutch equipment sector, which will, in turn, argue that it will continue to invest in order to stay ahead of the competition.

China is a special case, however. Being cut off by the United States and its allies from advanced semiconductors and equipment means that China's government, universities and companies are extra motivated to develop their own advanced equipment. Serious progress can be expected. However, the Chinese still have a long way before they arrive at the level of world-leading equipment manufacturers, and the US sanctions on Chinese R&D institutes will hamper this progress. Eventually, however, China's large investments and motivation to advance in this area could result in serious competition for Dutch equipment-makers in the long run.

[1] ASML, "ASML reports €21.2 billion net sales and €5.6 billion net income in 2022", visited 8 February 2023, https://www.asml.com/en/news/press-releases/2023/q4-2022-financial-results.

Map of Dutch semiconductor interests in Asia



For an interactive version of this map, visit: https://leidenasiacentre.nl/map-of-dutch-semiconductor-interests-in-asia