Swedish business in critical technology supply chains in China

A methodological discussion and empirical study

Tobias Junerfält, Monia Lougui

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Tobias Junerfält, Monia Lougui

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Sammanfattning

Svenska företags investeringar i utlandet, inklusive i auktoritära stater, är en viktig komponent i Sveriges exportdrivna ekonomi. Svensk affärsverksamhet i Kina innebär olika avvägningar, inklusive möjligheter till innovation men även risker för tekniköverföring. Den här studien introducerar en metod för att kartlägga svenska företags affärsverksamhet i Kina och kopplingen till kritiska teknikområden i EU och Kina. Metoden valideras och förbättras genom en empirisk studie, baserad på data från öppna källor, som omfattar 167 svenska företag med verksamhet i Kina. Lite mer än hälften bedöms inte ha någon produktionsverksamhet i Kina, utan fokuserar istället enbart på tjänster och handel. Typiska branscher inkluderar konsumentvaror och tjänster, industriprodukter och maskiner, affärstjänster, informations- och kommunikationsteknologi samt metallbearbetnings- och fordonsindustrierna. Ungefär hälften av de studerade företagen har tydliga kopplingar till EU:s och/eller Kinas kritiska teknikområden, medan resten har perifera eller inga kopplingar. Studien inkluderar flera företag på företag i till synes irrelevanta branscher som hanterar kritisk teknik, vilket stärker studiens betoning på en förutsättningslös bottom-up-kartläggning vid analys av företag i ett kritiskt tekniksammanhang. Framtida studier kan vidareutveckla den tillämpade metodens reliabilitet och detaljeringsnivå.

Nyckelord: EU, Kina, kritiska teknologiområden, försörjningskedjekopplingar, svenska företag, affärsverksamhet, industriklassificering

Summary

Swedish companies' investments abroad, including in authoritarian states, are an important component of Sweden's export-driven economy. Swedish business operations in China involve various trade-offs, including opportunities for innovation but also risks of technology transfer. This study introduces a method for mapping Swedish companies' business activities in China and their links to critical technology areas in the EU and China. The method is validated and improved through an empirical study based on open-source data covering 167 Swedish companies operating in China. Slightly more than half are assessed not to have any production activities in China but instead focus solely on services and trade. Common industries include consumer goods and services, industrial products and machinery, business services, information and communication technology, and the metalworking and automotive industries. Approximately half of the studied companies have apparent links to the EU's and/or China's critical technology areas, while the rest have peripheral or no connections. The study includes several companies in industries that, *prima facie*, appear irrelevant yet are engaged in critical technologies; these examples underpin the study's emphasis on an unprejudiced, bottom-up mapping process for analysing companies in a critical-technology context. Future studies could further develop the applied method's reliability and granularity.

Keywords: EU, China, critical technology areas, supply-chain links, Swedish companies, business activity, industry classification

Preface

Globalisation and economic openness have always been considered strengths, but when do they become weaknesses?

Interest in this question has increased in recent years among both academics, businesses and policy-makers. As the geopolitical landscape has evolved, prompting a reassessment of the role of trade and foreign investment, states have been compelled to add a security dimension to their understanding of globalisation and economic openness: the point at which perceived strengths may begin to pose risks. This shift has made Swedish investment in China, an important economic partner to Sweden, a pertinent focus and a matter of economic security.

This study presents and applies a methodology for assessing Swedish corporate presence in China and links to critical technology areas, to gauge where openness may cross into vulnerability.

At the time of writing (autumn 2025), the discussion within the European Union is intensifying about the need for a common strategy to safeguard the Union's economic security, reflecting the same question at Union level. Sweden is part of the discussion but needs empirical insight and methodological rigour to address the question credibly. It is the authors' hope that this report will contribute to that effort.

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Monia Lougui (FOI)

Project Manager, Economic Security

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Executive summary

International trade and investment are vital to Sweden's export-driven economy and its companies' success. This includes economic exchange with authoritarian states such as China, a major global market and manufacturing hub. Swedish companies benefit from having a presence in the Chinese market via production, innovation, services, and the sale of goods. At the same time, certain high-tech sectors have gained strategic importance, including for the EU and China. China is identified by the EU not only as a cooperation partner, but also as an economic competitor and systemic rival, and critical technology areas are linked to economic and national security interests. Swedish business activity in China is associated with both trade-offs and potential risks of undue technology transfer. Swedish companies with production in China, especially in critical technology areas where the party-state emphasises its self-reliance efforts, are the most vulnerable to legal or illicit technology transfer attempts from Chinese actors.

This study presents a method, based on open-source data, to map Swedish companies in China by business activity, industry classification, and supply-chain links to critical technologies in the EU and China. Whereas the industry classification serves to estimate a company's overall product and service portfolio, identification of supply-chain links to critical technology areas takes into consideration the specific technologies managed by the company. The method is assessed through an empirical study of selected Swedish companies. A notable contribution of the method is its attempt to go beyond binary assessments of company links to critical technology areas, applying a supply-chain perspective and differentiating between types and degrees of links. The study also puts emphasis on an unprejudiced, bottom-up mapping process when considering which companies to analyse in a critical technology context, based on the understanding that it is not automatically possible to determine whether a company is relevant to critical technology areas without first studying that company.

These methodological choices serve to highlight the importance of the myriad of suppliers in industries adjacent to those politically designated as critical, and sheds light on the difficulties of treating critical industries as isolated ecosystems. Moreover, over the course of the study, several examples were identified of companies within *prima facie* irrelevant industries, such as consumer goods, with business activity of relevance to critical technology areas. These would also possibly have been overlooked with a selective top-down mapping process.

The report examines 167 companies: 119 in Swedish corporate groups and 48 in foreign-owned groups with Swedish subsidiaries. Although the empirical study does not encompass all Swedish companies with business in China, it does provide unique insight into how those activities link to critical technology areas, a hitherto largely unexplored topic. The following are key results of the empirical study:

- 42 per cent of the studied companies have production in China, whereas 58 per cent deal only in services or sales of goods.
- Common industries for the studied companies include various consumer goods and services, industrial products and machinery, and business services, information and communication technology, as well as the metalworking and automotive industries. A large share of the studied companies within heavy industry have production in China, whereas those in business services, consumer goods and services, and information and communication technology to a large extent lack local production.
- The companies' supply-chain links to the EU's and China's critical technology areas vary widely. With regard to the EU's critical technology areas, out of 167 studied companies, 45 (27 per cent) have here been designated as Critical Technology Companies, 39 (23 per cent) as Suppliers, 15 (9 per cent) as General Services, and 68 (41 per cent) as Unrelated. Corresponding numbers of companies for China's critical technology areas are 54 (32 per cent), 41 (25 per cent), 15 (9 per cent), and 57 (34 per cent).
- Many companies operate across multiple critical technology areas, making total links greater than the number of unique companies. Slightly more than half of the Critical Technology Companies have production in China, in contrast to the overall pattern for the studied companies.
- When comparing the companies' industry classifications and their supply-chain links to critical technology areas, all of the studied companies within electronics, energy, biotechnology, information and communication technology, and metalworking have here been identified as Critical Technology Companies for both the EU and China. In contrast, companies in the automotive industry and health and medical technology have only been designated as Critical Technology Companies for China, not for the EU. Few companies in agriculture and food production or consumer goods and services, and no companies within construction, real estate, transportation or infrastructure, have been designated as Critical Technology Companies.
- Among the companies here identified as Critical Technology Companies, a large share are involved in different kinds of information technology, advanced materials, and manufacturing. Only a few are involved in biotechnology and aviation technology. None are involved in quantum technology or space technology.
- Meanwhile, there are numerous Suppliers identified for all critical technology areas. A majority of the Suppliers can be categorised as providers of intermediate inputs to smart manufacturing and/or to industrial production in general.

The mapping method used in this report is conducive to an improved understanding of Swedish business in China and adds nuance beyond binary assessments of company links to critical technology areas. However, the method also employs several types of simplification, not only for the sake of efficiency but also to account for limited data availability. There is also a certain ad hoc nature to the method, where assessments of the companies' business activity, industry classification, and supply-chain links to critical technology areas depend on the case-by-case availability, level of detail, and quality of company-specific data. The method's reliability and validity will thus vary, depending on the host and home country in focus, according to the accessibility and quality of open-source information, which is characterised by considerable variation. Further research could enhance the work in this report by refining models, expanding the scope of mapped companies, adding sources and company attributes, and deepening and broadening the risk analysis. Important attributes to emphasise in future research should be the mode of entry and ownership structures for Swedish companies in China. The method can also be applied to studies that focus on other home or host countries than Sweden and China.

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1 Introduction

International trade and investment are critical for Sweden, an export-driven economy, and the economic success of its companies. Sweden has international economic exchange not only with like-minded countries, but also with authoritarian states such as China, a major global market and manufacturing hub. Swedish companies operate across various industries in China, contributing to bilateral economic ties and benefiting from opportunities in production, innovation, services and sales of goods.

At the same time, the strategic importance of certain high-technology industries and sectors has grown, including for the EU and China. China is identified not only as a cooperation partner, but also as an economic competitor and systemic rival to the EU.[1] The EU has defined critical technology areas that involve technologies whose international transfer is a matter of both economic and national security interests. Apart from being critical from a supply-chain resilience and industrial competitiveness perspective, many of them are also dual-use technologies with both civilian and military applications, and with potential for misuse in human rights violations.[2]

There have been previous studies of Chinese investments in the EU and in Sweden, focussing both on mapping and risk analysis.[3] These studies have laid the foundation for a better understanding of the scope and significance of Chinese commercial and political interests in the European and Swedish economies. There is also research on flows in the opposite direction, that is, outbound investments from the EU, including Sweden, to China. However, there is limited information on how Swedish investments in China relate to critical technologies, as defined by the

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[1] "EU–China Relations factsheet," European External Action Service, 7 December 2023, https://www.eeas.europa.eu/eeas/eu-china-relations-factsheet_en.

[2] European Commission, *Commission Recommendation (EU) 2023/2113 of 3 October 2023 on critical technology areas for the EU's economic security for further risk assessment with Member States* (European Commission, 2023), 5–6, https://eur-lex.europa.eu/legal-content/SV/TXT/?uri=CELEX:32023H2113.

[3] See, for example, the annual updates on Chinese FDI in the EU through joint research by the Rhodium Group and MERICS, the latest of which is Agatha Kratz, Max J. Zenglein, Andreas Mischer, Gregor Sebastian, and Armand Meyer, *Chinese investment rebounds despite growing frictions—Chinese FDI in Europe: 2024 Update* (Rhodium Group and MERICS, 2025), https://merics.org/en/report/chinese-investment-rebounds-despite-growing-frictions-chinese-fdi-europe-2024-update; Oscar Almén and Christopher Weidacher Hsiung, *China's Economic Influence in the Arctic Region: The Nordic and Russian cases*, FOI-R--5326--SE (Swedish Defence Research Agency (FOI), 2022), https://www.foi.se/en/foi/reports/report-summary.html?reportNo=FOI-R--5326--SE; Oscar Almén, *Kinesiska investeringar i Sverige: en kartläggning*, FOI-R--5474--SE (Swedish Defence Research Agency (FOI), 2023), https://www.foi.se/rapportsammanfattning?reportNo=FOI-R--5474--SE; and Tobias Junerfält and Emil Wannheden, *Manufacturing Vulnerabilities: Chinese Minerals, Semiconductors and Green Technologies in the EU*. FOI-R--5524--SE (Swedish Defence Research Agency (FOI), 2024), https://www.foi.se/rest-api/report/FOI-R--5524--SE.

political spheres in the EU and China.[4] Meanwhile, risks pertaining to the potential leakage of critical technologies, including through outbound investments, are pressing policy issues in the EU and Sweden.

The idea for this study was born in late 2023 while finalising a report on Chinese investments in the EU.[5] Coincidentally, in January 2024, the European Commission presented new white papers on outbound direct investments and exports of dual-use products, two closely related issues. The Commission emphasised the lack of mapping of outbound direct investments from the EU and the difficulties of performing robust and deep-going risk analyses, especially related to technology leakage.[6]

Furthermore, in January 2025, the Commission presented a recommendation to the EU member states on mapping and risk analysis of outbound investments, based on the previous white paper.[7] The Commission does not explicitly identify China as the target of these new potential policy measures. The white paper speaks vaguely of concerns that "some sensitive technologies and know-how could end up in the wrong hands" and of "cutting edge EU technology reach[ing] countries where the boundaries between civil and military activities are blurred."[8] However, economic exchange with China is identified explicitly as a risk in other contexts, for instance, in a 2023 speech on EU-China relations by European Commission president Ursula von der Leyen. In her speech, von der Leyen spoke of economic de-risking from China in the context of trade and investment, particularly in sensitive technologies, highlighting concerns over technology transfers and the close links between China's military and commercial sectors.[9] It can be surmised that more knowledge on risks pertaining to technology leakage to China is an important matter for the EU. As an EU member state, Sweden also has a need for more detailed understanding of these questions. Understanding the involvement of Swedish companies in critical technology areas within China is thus vital for policymakers, industry stakeholders, and researchers alike.

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[4] European Commission, *Commission Recommendation (EU) 2023/2113.* See also Section 1.2.1.

[5] Junerfält and Wannheden, *Manufacturing Vulnerabilities.*

[6] European Commission, *White Paper on Outbound Investments COM(2024) 24 final* (European Commission, 2024), 5, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52024DC0024.

[7] European Commission, *Commission Recommendation (EU) 2025/63 of 15 January 2025 on reviewing outbound investments in technology areas critical for the economic security of the Union* (European Commission, 2025), https://eur-lex.europa.eu/eli/reco/2025/63/oj/eng. For a more thorough comparison of the 2024 white paper and the 2025 recommendation on outbound direct investments, see Aron Björk, *Utgående direktinvesteringar och ekonomisk säkerhet*, FOI Memo 8804 (Swedish Defence Research Agency (FOI), 2025), https://www.foi.se/rest-api/report/FOI%20Memo%208804.

[8] European Commission, *White Paper on Outbound Investments*, 2.

[9] "Speech by President von der Leyen on EU-China relations to the Mercator Institute for China Studies and the European Policy Centre," European Commission, 30 March 2023, https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2063.

There are openly available aggregate statistics on Swedish business presence in China. For example, Sweden's National Board of Trade (*Kommerskollegium*) keeps statistics on Swedish direct investments in China, with respect to total assets and annual flows. In 2023, total assets in China corresponded to SEK 104 billion, a decrease compared to SEK 131 billion in 2022. Total investment flows to China in 2024 corresponded to SEK 4.5 billion, an increase compared to SEK 1.7 billion in 2023, but still at low levels compared to SEK 10.8 billion in 2021 and SEK 15.7 billion in 2022.[10]

Meanwhile, the Swedish Agency for Growth Policy Analysis (*Tillväxtanalys*) has statistics on turnover and number of employees for all Swedish corporate groups with subsidiaries in China. In 2022, the total turnover was SEK 238.5 billion, of which SEK 187.7 billion (78.7 per cent) stemmed from the manufacturing industry, and SEK 50.7 billion (21.3 per cent) from the service sector. There was a similar distribution for the number of employees in manufacturing (71.3 per cent) and in services (28.6 per cent). In 2022, a total of 83,039 employees belonged to Swedish subsidiaries in China, a decrease of 10,314 people compared with 2021. Corporate groups with more than 1,000 employees represented 75.2 per cent of total employees, whereas 24.8 per cent of employees belonged to corporate groups with fewer than 1,000 employees. However, only 1,169 people (1.4 per cent) belonged to corporate groups with fewer than 50 employees.[11]

1.1 Purpose and research question

While the data presented above provides a quantitative overview of Swedish business in China, the overview fails to provide an indication of the involvement of Swedish companies in critical technology areas as defined by the EU and China. The lack of both data and a structured method to map and analyse the link between Swedish investment in China and critical technology supply chains creates a knowledge gap. It is, therefore, difficult for policymakers to assess to what extent Swedish business activity in China intersects with national security concerns, particularly regarding the risks associated with technology transfer. This also gives rise to a policy risk, in terms of either under- or overestimating risks pertaining to Swedish business activity in China. In turn, this may result in the Swedish government's either under- or overregulating Swedish investment in China.

The main purpose of this study is to introduce a new approach to map the business activities of Swedish companies in China, with regard to critical technology areas

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[10] "Direktinvesteringar—tillgångar och flöden," Swedish National Board of Trade, accessed 16 May 2025, https://www.kommerskollegium.se/utrikeshandel-och-statistik/handelsstatistik/direktinvesteringar/.

[11] Swedish Agency for Growth Policy Analysis, *Statistik 2024:05 Svenska koncerner med dotterbolag i utlandet 2022*, 26 September 2024, 4, 16, 23, 31, https://www.tillvaxtanalys.se/download/18.2d9222ef1921c8305804d85f/1727366274574/Statistik_2024_05%20Svenska%20koncerner%20med%20dotterbolag%20i%20utlandet%202022_2.pdf.

and their supply chains, based on open-source data. The study seeks to answer the following research question:

> *How can we map the business activities of Swedish companies in China and their supply-chain links to critical technology areas using open-source data?*

The suggested approach is empirically assessed and inductively improved by applying the method to a selected number of Swedish companies with business activities in China. The empirical study serves both for quality checks and continuous methodological improvement, as well as providing the reader with more insight into the business activity of Swedish companies in China and how it ties to critical technology areas.

1.2 Definitions and delimitations

This section describes important definitions and delimitations pertaining to the critical technology areas that receive emphasis in the methodology and the scope of the empirical study.

1.2.1 Critical technology areas

This study takes as its starting point the technology areas that the political spheres in the EU and China identify as especially critical for economic and national security. Specifically, they comprise the ten technology areas that the European Commission has identified as critical to the EU's economic security, and the ten critical industries in China's industrial policy programme Made in China 2025 (see Tables 1 and 2).

From an EU regulatory perspective, the EU's own designated critical technology areas are naturally the most crucial to emphasise; however, we also consider China's critical technologies because of technology-transfer risks, and China's potential interest in certain EU technologies beyond those the EU itself emphasises.

Table 1. Ten critical technology areas for the EU's economic security.

1.	Advanced semiconductor technologies
2.	Artificial intelligence technologies
3.	Quantum technologies
4.	Biotechnologies
5.	Advanced connectivity, navigation and digital technology
6.	Advanced sensing technology
7.	Space and propulsion technology
8.	Energy technologies
9.	Robotics and autonomous systems
10.	Advanced materials, manufacturing and recycling technologies

Source: European Commission.[12]

[12] European Commission, *Commission Recommendation (EU) 2023/2113.* See pp. 5–6 for examples of specific technologies.

Table 2. Ten critical technology areas identified in Made in China 2025.

1.	Next-generation information technology
2.	High-end computerised machines and robots
3.	Aviation and space equipment
4.	Maritime engineering equipment and high-tech ships
5.	Advanced railway transportation equipment
6.	Energy-saving and new energy vehicles
7.	Energy equipment
8.	Agricultural machinery
9.	New materials
10.	Biomedicine and high-performance medical equipment

Source: State Council of China.[13]

The ten critical technology areas designated by the European Commission (hereafter EU10) were identified on the basis of their importance to economic security and the need to prevent technology leakage. The first four technologies, namely advanced semiconductor technologies, artificial intelligence technologies, quantum technologies, and biotechnology, receive special emphasis. According to the European Commission, these four technology areas merit special risk assessment because of their potential to enable and transform various sectors and capabilities, their dual-use nature (that is, both civil and military applications), and the risk of misuse resulting in violations of human rights and fundamental freedoms.[14] However, this study considers not only the first four but all ten technology areas identified as critical for the EU. This is because technologies and industries emphasised at the EU level may not perfectly overlap with national priorities, and priorities may shift over time.

Made in China 2025 is a Chinese high-technology industrial policy programme, launched as early as 2015. Its origins lie in a joint research project by the Chinese Academy of Engineering and the Ministry of Industry and Information Technology that explored ways to upgrade China's manufacturing capabilities.[15] Despite its name, the programme has more far-reaching ambitions, stretching beyond 2025, for China to become a leading and self-reliant manufacturing superpower. The ten critical technology areas (hereafter MIC25) span broad industries, with more detailed aims set out for each industry and its subindustries in sectoral strategies and other policy documents, such as the 14th Five-Year Plan. Some specific technologies are characterised by lower self-sufficiency and are of greater strategic

[13] 中国制造 2025 ["Made in China 2025,"] State Council of China, 19 May 2015, https://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm.

[14] European Commission, *Commission Recommendation (EU) 2023/2113*, 1–2.

[15] Tai Ming Cheung, *Innovate to Dominate: The Rise of the Chinese Techno-Security State* (Ithaca; London: Cornell University Press, 2022), 238.

importance than others for China. After negative reactions from the West, official ambitions pertaining to Made in China 2025 have been toned down by the Chinese government. Meanwhile, in large part the same industries are emphasised in other key strategic documents, such as the aforementioned 14th Five-Year Plan, and the Innovation-Driven Development Strategy.[16]

There are some differences in terms of emphasised technologies across the different Chinese strategy documents, but the choice has been to focus on MIC25 here, despite the existence of other, including newer, strategies. This choice is motivated by MIC25's focus on advanced manufacturing, its recognisability to the international economic-security analyst and policy community, its continued importance for China's technology policy, and its similarities with EU10. A revised, future mapping methodology could, for example, use the forthcoming 15th Five-Year Plan (for 2026–30) as a starting point instead.

Similar to the EU's critical technology areas, many of those identified in Made in China 2025 and other important Chinese strategy documents are also characterised as dual-use. It is a built-in feature of Chinese technological and industrial policy programmes to promote synergies between China's civilian and defence industries. In fact, China has defence-specific policy programmes that run in parallel with primarily civilian-oriented ones, such as Made in China 2025, and they overlap in prioritised technology areas.[17]

From a bird's-eye view, there is significant overlap between EU10 and MIC25. For instance, EU10's *Advanced semiconductor technologies*, *Artificial intelligence technologies*, *Quantum technologies*, *Advanced connectivity, navigation and digital technology*, and *Advanced sensing technology* can be regarded as components of what MIC25 refers to as "*Next-generation information technology*." However, MIC25 also emphasises certain technology areas that EU10 does not, notably aviation, marine, and railway technology, as well as medical technology, electric vehicles, and agricultural machinery. Moreover, the EU and China are motivated by different considerations when defining their respective critical technology areas. Whereas the focus of EU10 is on protecting technologies whose leakage would be detrimental to its economic security, MIC25's focus is on

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[16] For comparisons of the various key strategic documents, see, for example, Björn Cappelin, *Kinas industripolitik: nulägesbild, riktningen framöver och konsekvenser för Sverige* (Nationellt kunskapscentrum om Kina, 2022), https://kinacentrum.se/publikationer/kinasindustripolitik-nulagesbild-riktningen-framover-och-konsekvenser-for-sverige/; and Frida Lampinen and Anders Schröder, *Innovation Capacity in the People's Republic of China: On the state of the innovation assessment literature and strategic ambitions in science and technology governance*, FOI-R-5771—SE (Swedish Defence Research Agency (FOI), 2025), https://foi.se/rapporter/rapportsammanfattning.html?reportNo=FOI-R--5771--SE. There have also been reports of a 2.0 plan for Made in China 2025 being underway, see "Xi Mulls New Made-In-China Plan Despite Us Calls to Rebalance," *Bloomberg*, 25 May 2025, https://www.bloomberg.com/news/articles/2025-05-26/xi-plans-new-made-in-china-effort-even-as-trump-aims-to-boost-us-manufacturing.

[17] For more details on defence-specific strategies and military-civil fusion, see Cheung, *Innovate to Dominate*.

acquiring desired technologies. That said, it is beyond the scope of this study to provide a detailed analysis of similarities and differences between EU10 and MIC25, aside from limited comparisons in Section 4.2 when discussing the empirical results.

1.2.2 Scope of the empirical study

The empirical study to assess and improve the mapping methodology presented in this report is based on a selected sample of Swedish companies in China. Specifically, the member list of the Swedish Chamber of Commerce in China is used as reference, focusing on companies that were members for the period May 2024–February 2025.[18] The selection process is thoroughly described in Section 3.2.1.

It should be emphasised that only a subset of all Swedish companies with business in China are members in the Swedish Chamber of Commerce in China. The empirical study focuses on a selected group of corporate groups with operations in both Sweden and China. Rather than aiming for comprehensive coverage, the study is designed to evaluate and refine the methodology for mapping supply-chain links to critical technology areas in overseas business operations. The selection is motivated both by the limited access to an openly available comprehensive list of Swedish companies with activity in China, and the methodological focus of the study, with emphasis on depth rather than breadth. It is worth noting that there may be various reasons for a Swedish company not to become a member of the Swedish Chamber of Commerce in China. Although speculative, it is possible that one such reason is evasion of scrutiny for companies engaged in sensitive sectors, possibly including critical technology areas.

Swedish companies in China, as defined in this study, include subsidiaries of Swedish multinational corporate groups based in Sweden, as well as subsidiaries of foreign multinational corporate groups that also maintain business operations in Sweden. This definition is not uncontroversial, in that it includes companies with foreign ownership that would not normally be considered Swedish, and whose business activities outside Sweden are largely beyond the reach of potential EU and Swedish regulations on outbound investments. However, the argument here is that the context of technology-transfer risks and the existence of subsidiaries in both Sweden and China make them relevant to include. Moreover, Swedish export controls for flows of goods and services from Sweden to China are also applicable to foreign-owned corporate groups. Membership in the Swedish Chamber of Commerce in China indicates that there is some form of tie between the subsidiaries in Sweden and China, even for foreign-owned corporate groups. However, the ties between business activities in Sweden and China can vary considerably across different corporate groups. In some cases, ties are made apparent through

[18] Swedish Chamber of Commerce in China, "Corporate Members," accessed 1 July 2025, https://www.swedcham.cn/membership-directory/corporate.

openly available corporate structures, where the Chinese subsidiary is hierarchically subordinate to the Swedish one, or in the company's own account of its business and history. In some cases, the foreign-owned corporate groups are *de facto* Swedish corporate groups, for example, with a group parent company consisting of a holding company in Luxembourg or the Netherlands. In other cases, it is not obvious whether the establishment of business activity in China has or has had any ties to the business activity in Sweden. Furthermore, corporate groups with a foreign-owned group parent company may also, to varying degrees, have Swedish majority or minority ownership, which has implications for the extent of ties to Sweden.

The selected sample of Swedish companies studied in this report is not limited to including companies within a subset of critical technology areas, despite the 2025 recommendation from the European Commission.[19] Instead, the empirical study covers companies across all industries and sectors, based on the understanding that it is not automatically possible to determine whether a company is relevant to critical technology areas without first studying that company. Over the course of the study, several examples were identified of companies within *prima facie* irrelevant industries, such as consumer goods, that are engaged in critical technology areas. Accordingly, this study emphasises the importance of an unprejudiced, bottom-up mapping process when considering which companies to analyse in a critical technology context, rather than a selective top-down process.

Despite the study's focus on critical technology areas and the selection of companies, it is not intended to criticise individual Swedish companies with operations in China or the institutions supporting their activities, such as the Swedish Chamber of Commerce in China and Business Sweden. The publicly available list of member companies served simply as a convenient starting point and to delimit the scope for the empirical study. However, the emphasis on critical—and often dual-use—technologies for the EU and China naturally entails certain risk considerations. In this report, these risks are addressed at a general level rather than on a company-by-company basis. See Chapter 2 for the discussion on business trade-offs and risks of technology transfer associated with Swedish business activity in China. In addition, the results of the empirical study are presented, in Chapter 4, in aggregate form, not at the individual company level. While risks pertaining to individual companies are not discussed, the empirical study aims to provide insight into the nature of Swedish business activity in China and the types of links between companies and critical technology areas, based on empirical, albeit incomplete, data.

[19] European Commission, *Commission Recommendation*, 2–3.

1.3 Disposition

Chapter 2 presents the study’s contextual framework in terms of business trade-offs and potential risks of technology transfer associated with Swedish business activity in China. Chapter 3 describes and discusses the theoretical mapping methodology and the empirically tested version used in this study. Chapter 4 presents the results of the empirical study, through an overview and analysis of the mapped Swedish companies in China. Chapter 5 discusses the empirical study and presents the study’s conclusions. Chapter 6 provides suggestions for future research.

2 Contextual framework: Business trade-offs and technology transfer risks

This chapter provides a contextual framework for the study by discussing business trade-offs and technology-transfer risks associated with doing business in China.

2.1 Pros and cons for Swedish business in China

Team Sweden in China, represented by Business Sweden, the Swedish Chamber of Commerce, the Embassy of Sweden and the Consulate General of Sweden in Shanghai, conducts regular surveys of Swedish companies' views on the business climate in China. The latest report dates from 2025 and encompasses responses from 98 member companies of the Swedish Chamber of Commerce in China.[20] The respondents thus represent a subset of the companies studied in this report, setting aside potential discrepancies due to differences between the specific companies covered by this study and those covered by the survey. Nevertheless, the survey results should be broadly representative of the companies studied herein and their views on doing business in China.

Judging by the Team Sweden survey report, Swedish companies see both challenges and opportunities in doing business in China. China's economic slowdown and geopolitical risks, such as the US–China trade war, are major concerns, whereas China's market size, growth potential and cost efficiency represent major opportunities. A majority of Swedish companies intend to maintain or increase current levels of investment in China. Moreover, Swedish companies perceive favourable conditions regarding personal safety, infrastructure, and access to Chinese supply chains, while some of the main issues relate to the financial system, market access, transparency, and equal treatment.[21] Business Sweden has also previously

[20] Luting Fan, Per Portén, Johan Ming Chou Chen, Malin Hammarén, Erik Lindner Olsson, Lennart Nilsson, and David Jallow, *Business Climate Survey for Swedish Companies in Mainland China 2025: A Report from Team Sweden in Mainland China* (Business Sweden in China, Swedish Chamber of Commerce in China, Embassy of Sweden in China, Consulate General of Sweden in Shanghai China, 2025), 40, https://www.swedcham.cn/sites/default/files/2025-05/2025%20BCS_Final%200528%281%29.pdf.

[21] Fan et al., *Business Climate Survey for Swedish Companies in Mainland China 2025*, 4–5, 14–5, 23.

identified China's alignment with Russia and force majeure (e.g., flooding, heat-waves, power outages) as uncertainties and disruptions associated with the Chinese market.[22]

The vast business opportunities associated with being present in China and having close access to Chinese businesses and consumers are naturally a huge pull factor for Swedish companies, and for foreign companies overall, to invest in China. Swedish companies' sales in China outnumber Swedish exports to China many times over. In addition to sales opportunities, the efficient supply chains associated with Chinese manufacturing clusters and industrial parks, and lower labour costs, enable low-cost and high-margin manufacturing operations for foreign companies in China. For many companies, revenues from the Chinese market can potentially create more space for research and development (R&D) and future competitiveness at a global level. Another pull factor is having access to China's large talent pool of engineers, and Chinese and foreign business partners within emerging industries. Together with China's rapid industrial dissemination of AI technology and smart manufacturing, there are many convincing arguments to invest in China for foreign companies seeking new ways to achieve process and product innovation, productivity, and growth.[23] Swedish companies surveyed by Team Sweden in China cite cost optimisation, shortening lead times, and adapting to local demand as strong reasons to keep investing in China to maintain competitiveness. Large industrial companies are especially likely to further onshore their supply chains in China.[24]

A majority of the Swedish companies surveyed by Team Sweden reported profitable business in China in 2024, even though many also experienced declines in revenue and in profit growth.[25] However, promises of turning profits from the Chinese market into global R&D expenditure might fall short in some sectors of the Chinese economy, where profit margins are low due to overcapacity and fierce price competition from Chinese companies, whether due to state support or to excessive domestic price wars (sometimes referred to as "*involution*"). Examples include the automotive industry, compound (silicon-carbide) semiconductors, and solar panels.[26] Swedish companies surveyed by Team Sweden in China recognise that overcapacity and price wars in the Chinese market are a threat to their profitability and, by extension, innovation.[27]

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[22] Per Portén, Johan Thurée, and Frida Haapaniemi, *Navigating Uncertainty: Building resilience and agility into your China strategy* (Business Sweden, 2022), 6, 13, https://www.business-sweden.com/4abfa5/globalassets/insights/reports/navigating-uncertainty.pdf.
[23] Portén, Thurée and Haapaniemi, *Navigating Uncertainty*, 2–5.
[24] Fan et al., *Business Climate Survey*, 27.
[25] Ibid., 8–9.
[26] Jeroen Groenewegen-Lau and Jacob Gunter, *The trade-offs of innovating in China in times of global technology rivalry* (MERICS, 2025), 7, https://merics.org/en/report/trade-offs-innovating-china-times-global-technology-rivalry. The Chinese word for involution is 内卷.
[27] Fan et al., *Business Climate Survey*, 5, 11.

Foreign companies doing business in China also have access to various types of state support. China has a Catalogue of Encouraged Industries for Foreign Investment that lists industries, including specific products and technologies, where foreign investments in manufacturing, R&D, and services are welcomed and subject to preferential treatment. The latest version of the catalogue is from 2022, with a pending 2025 revision. The 2025 revision contains 1,700 items: 620 items pertaining to nationwide priorities, and 1,080 items specific to the central, western, and northeastern regions of China. Preferential treatment may differ between provinces, but includes reduced corporate income taxes, low-cost industrial land, and tariff exemptions for imported equipment to companies, offered by local governments. Many of the prioritised technology areas are familiar from Made in China 2025 and similar policy programmes. This includes, but is not limited to, smart and green manufacturing, with a focus on automation, intelligentisation, and high-performance and energy-saving equipment, generative AI, healthcare and medical devices, batteries, new energy vehicles, energy production and power management equipment, mining equipment, semiconductors, and railway transport, maritime, and aviation technology. The list also covers many categories from sectors beyond the critical technology areas, such as fisheries, food processsing, textiles, transportation, warehousing, culture, and tourism.[28] In sum, Swedish companies in both critical technology and other sectors in China may receive different kinds of state support for their local business operations.

The greater the foreign company's technology leadership and usefulness for China's strategic ambitions, the greater the incentives provided to attract investment in local operations. However, once the technological leadership of a foreign company weakens relative to Chinese competitors, the Chinese state is likely to leave the foreign company to fend for itself, or even force it out of China, and help domestic alternatives claim greater market shares. Part of China's efforts for industrial self-sufficiency and the creation of national champions are buy-local requirements that favour Chinese companies over foreign companies, even those with local production. This has already been a pattern in several industries, such as high-speed rail, 5G, and electric vehicles (including batteries), representing many companies that historically have had a significant amount of localised technology and R&D. Companies producing certain industrial machinery and software, medical devices, and legacy semiconductors are currently facing the same prospect.[29] Alongside other trade barriers such as customs procedures, customs duties, and state aid, Swedish companies surveyed by Team Sweden in

[28] Qian Zhou, "China Released Draft Encouraged Catalogue to Boost Foreign Investment," 24 December 2024, https://www.china-briefing.com/news/china-2022-encouraged-catalogue-updated-implementation-from-january-1-2023/; 关于征求对《鼓励外商投资产业目录》（公开征求意见稿）意见的公告["Announcement on Soliciting Opinions on the Catalogue of Industries Encouraged for Foreign Investment (Draft for Public Comment,")] National Development and Reform Commission of China, 20 December 2024, accessed 27 June 2025, https://yyglxxbsgw.ndrc.gov.cn/htmls/article/article.html?articleId=2c97d16b-93251263-0193-de120be6-000f#iframeHeight=810.

[29] Groenewegen-Lau and Gunter, *The trade-offs*, 5, 16; Gregor Sebastian and François Chimits, "'Made in China' electric vehicles could turn Sino-EU trade on its head," MERICS, 30 May 2022, https://merics.org/en/comment/made-china-electric-vehicles-could-turn-sinoeu-trade-its-head.

China also report that domestic procurement biases have a negative effect on their business. This was especially the case for industrial companies competing in public procurement in strategic sectors. For these sectors, knowledge of local markets and policy, and government relations, are described as crucial to remaining competitive.[30]

2.2 The technology transfer issue

The discussion above contextualises the presence of Swedish companies in China with respect to the challenges and opportunities associated with their business activities. However, risks related to technology transfer, which are especially relevant in the context of critical technology areas for the EU and China, have yet to be addressed. This is a type of risk that the European Commission explicitly associates with the EU's critical technology areas and with the process of reviewing the need for outbound-investment screening.[31] This issue is not widely discussed in the aforementioned Team Sweden survey-based report. Surprisingly, only 10 per cent of the surveyed companies report the protection of intellectual property rights as one of their major concerns.[32] Moreover, among the respondent companies in the Team Sweden survey, almost all (97 per cent) stated that they had not encountered human rights violations in China. Somewhat paradoxically, almost half (48 per cent) of the surveyed companies also reported difficulties in ensuring transparent supply chains.[33] Whereas this study does not aim to provide a detailed risk analysis for individual companies, the issue of technology transfer is discussed below at a general level.

Technology transfer can take place both legally and illegally. However, regardless, it poses a risk if the potential consequences are (1) a loss of competitiveness for the Swedish or European industry and, by extension, increased exposure to economic coercion from China, and/or (2) that Swedish technology ends up in the hands of Chinese actors who contribute to China's military modernisation. These risks are relevant in the context of China being not only an economic competitor but also a systemic rival to the EU, and an actor that instrumentalises economic dependencies by using its market dominance for coercive purposes to achieve its foreign policy goals.[34] The EU has maintained an arms embargo on China since the party-state's violent crackdown on the student protests in Tiananmen Square

[30] Fan et al., *Business Climate Survey*, 5, 18, 21.
[31] European Commission, *White Paper*, 7–8.
[32] Fan et al., *Business Climate Survey*, 16.
[33] Ibid., 34.
[34] European External Action Service, "EU–China Relations factsheet."

in 1989.[35] Lastly, foreign technology transfer to the Chinese industry risks benefitting Russia, whose dependence on Chinese technology imports is significant, and thus its military build-up.

Technology transfer from Swedish companies in China can take place in various ways and with varying degrees of voluntariness. There are many actors within the Chinese state, academia, and enterprises who cooperate to gain access to foreign technology for the sake of the domestic civilian and defence industries.[36] Transfers can be legal, such as sales of software licenses or physical technological goods to Chinese business partners. Technology transfer can also be a formal or informal condition for gaining access to the Chinese market or economic aid from the Chinese state, through regulations enforced by government agencies such as the National Development and Reform Commission and the Ministry of Commerce. Talent recruitment of key personnel and dissemination of technical know-how are other means for technology transfer, which can take place either voluntarily, possibly encouraged by China's many and generous talent recruitment programmes, or through blackmail. Talent recruitment programmes involve all parts of the Chinese system, but the United Front Work Department merits special mention. It is a Chinese Communist Party organ that works to co-opt foreign experts and organisations to achieve the ambitions of the party-state. Moreover, technology transfer through industrial and cyber espionage is a prominent risk for foreign businesses in China. One of the key actors in this regard is the Ministry of State Security, the chief intelligence agency in China, which is infamous for using other Chinese actors as fronts for its operations.[37]

It seems plausible that much potential technology transfer, in aggregate, from Swedish companies in China may already have taken place, given that many of them have been established in China for several decades. It is evident from Team Sweden's survey, covering 98 of the Swedish companies in China, that a large share (40 per cent) have been present in China at least since the early 2000s, and only 1 per cent of respondents were identified as newcomers.[38] Moreover, the

[35] "Sanctions against China," Government of Sweden, accessed 30 June 2025, https://www.government.se/government-policy/foreign-and-security-policy/international-sanctions/geographical-sanctions/china---sanctions/.

[36] The reasoning here draws on a previous FOI report, in turn based on a comprehensive literature review, that describes the different actors within the Chinese system who are associated with technology transfer; see Tobias Junerfält, *China's Technology Transfer Ecosystem—Key Actors and the Case of China Electronics Technology Group Corporation*, FOI-R--5641--SE (Swedish Defence Research Agency (FOI), 2024), https://www.foi.se/en/foi/reports/report-summary.html?reportNo=FOI-R--5641--SE. Academic research on technology transfer, especially of the legal kind, associated with foreign direct investments, goes back decades. See, for example, Wilbur Chung, "Identifying Technology Transfer in Foreign Direct Investment: Influence of Industry Conditions and Investing Firm Motives," Journal of International Business Studies 32 (June 2001): 211–29, https://link.springer.com/article/10.1057/palgrave.jibs.8490949.

[37] Junerfält, *China's Technology Transfer Ecosystem.*

[38] Fan et al., *Business Climate Survey*, 40.

degree of technological sophistication among Chinese companies in many industries, including the critical ones, is now at a completely different level than it was 20–30 years ago. While legal and illegal technology transfer from foreign companies is part of the explanation, the utility of foreign technology transfer for the Chinese industry was much greater in the past than it is today. That said, this does not mean current technology transfer risks are negligible. The risks today are likely to be the greatest in certain high-technology niches within the industries prioritised by the Chinese party-state, as represented here by Made in China 2025, where the domestic Chinese industry still has dependencies on foreign technology.[39] Moreover, ongoing R&D efforts and potential breakthroughs by Swedish companies in China may still be of interest to Chinese companies and the Chinese state, also in technology areas where China already holds a strong position.

However, risks of involuntary technology transfer are likely to differ considerably, in general, depending on the type of business activity conducted by a Swedish company in China. The risk ought to be greatest for companies with production operations, especially manufacturing, since the manufacturing process is made available for direct observation, possibly involving personnel who possess critical know-how. The same goes for design and R&D, here treated as a subset of production. Industrial espionage is an obvious risk, as is the prospect of personnel being recruited by Chinese actors and encouraged, possibly under extortion, to share their company secrets and technical know-how. In this context, it is worth noting that industrial parks in China often have state-governed facilities (e.g., "technology-transfer centres") that are established with the explicit purpose of collecting and converting technology, including from foreign companies, to commercialisable goods.[40] Moreover, cyber espionage is a risk regardless of whether the manufacturing or R&D activity is conducted in China or in Sweden, but there are factors such as local data storage and weak legal protection that increase the risks in China.

It also bears mention that, since the 1990s, Chinese law has required companies to allow the establishment of Chinese Communist Party organisations. Over time, the Party's influence over business has deepened, extending beyond state-owned enterprises to encompass the private sector and, increasingly, foreign-owned companies. Today, Party organisations are expected to participate in corporate governance in line with Party interests, though the extent of such involvement varies. Their presence is most notable in Sino-foreign joint ventures, while wholly foreign-owned enterprises appear to be less affected.[41] In the context of technology transfer risks, it is particularly relevant that the Chinese partners of Swedish

[39] Junerfält, *China's Technology Transfer Ecosystem*, 16.
[40] Ibid., 26.
[41] Oscar Almén and Hanna Carlsson, *The Chinese Communist Party's influence over businesses*, FOI-R--5695—SE (Swedish Defence Research Agency (FOI) and the Swedish National China Centre, 2025), 7–8, 42, https://www.foi.se/rapporter/rapportsammanfattning.html?reportNo=FOI-R--5695--SE.

companies may face internal political incentives or pressure to engage in activities, such as joint R&D, that serve broader strategic rather than purely commercial objectives.

The risk of technology leakage is naturally lower if the manufacturing processes in China are decoupled from the company's most sophisticated technology, including limited involvement from key personnel. Analogously, risks will not be the same if the localised R&D relates to adaptation of existing products to local demands, rather than technological breakthroughs for the company. Companies seek to prevent the unwanted spread of their most sensitive technologies, to varying degrees of success, by limiting information sharing and personnel flows between, for instance, the headquarters and overseas subsidiaries.[42] Over the past decade or so, risk awareness and related policies have likely been strengthened among many companies, as geopolitical considerations have become more prominent.[43]

Even within a company's own structure, there is a risk of sensitive knowledge spreading unintentionally, prompting technologically leading companies, such as Taiwanese semiconductor giant TSMC, to exercise caution, for instance by withholding their most advanced technologies when expanding abroad, and by being restrictive about forming joint ventures, particularly overseas.[44] However, technology transfer to an overseas subsidiary is not entirely prevented by limiting the use of joint ventures and their most advanced technologies. For example, personnel mobility, shared IT systems, and cross-border collaboration remain venues for the spread of potentially sensitive know-how.[45]

In the context of the preceding paragraphs, it is noteworthy that almost all Swedish companies (99 per cent) answering Team Sweden's survey stated that there was no decoupling between their global headquarters and operations in China.

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[42] See, for example, Pedro de Faria, and Wolfgang Sofka, "Knowledge Protection Strategies of Multinational Firms: A Cross-Country Comparison," *Research Policy* 39:7 (2010): 956–68. https://doi.org/10.1016/j.respol.2010.03.005.

[43] See, for example, "New Report Finds American Businesses Significantly Increasing Focus on Geopolitical Risk," U.S. Chamber of Commerce Foundation, April 22 2025. https://www.uschamberfoundation.org/emerging-issues/new-report-finds-american-businesses-significantly-increasing-focus-on-geopolitical-risk.

[44] Moreover, TSMC needs approval from the Taiwanese state for joint ventures overseas; see Jeanny Kao, "TSMC needs government permission for overseas joint ventures, Taiwan minister says," *Reuters*, 27 February 2025, https://www.reuters.com/technology/tsmc-needs-government-permission-overseas-joint-ventures-taiwan-minister-says-2025-02-27/?utm_source=chatgpt.com.

[45] See, for example, João J. Ferreira, Cristina I. Fernandes, Ying Guo, and Hussain G. Rammal, "Knowledge Worker Mobility and Knowledge Management in MNEs: A Bibliometric Analysis and Research Agenda," *Journal of Business Research* 142 (2022): 464–75, https://www.sciencedirect.com/science/article/pii/S014829632100970X; Francesco Ciabuschi, "On IT Systems and Knowledge Sharing in MNCs: A Lesson from Siemens AG," *Knowledge Management Research & Practice* 3 (2005): 87–96, https://doi.org/10.1057/palgrave.kmrp.8500057; and Mohan Subramaniam, "Integrating Cross-Border Knowledge for Transnational New Product Development," *The Journal of Product Innovation Management* 23 (2006): 541–55, https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5885.2006.00223.x.

However, the survey results suggest some companies have separate IT systems for their China operations, and a majority (72 per cent) do not localise R&D to China to any great extent. This does not mean there is no R&D activity taking place at all; 61 per cent of the respondents stated they conduct R&D in China, with product development as the main focus. Only a small minority of the surveyed companies stated they conduct fundamental research in China. Industrial companies are also the least likely to localise R&D, with a key concern being intellectual-property protection. Interestingly, large companies localise R&D more than SMEs do.[46] Judging by the overall statistics for Swedish companies abroad, total R&D expenditure for Swedish corporate groups in China is in fact quite significant. In 2021, Swedish corporate groups spent SEK 5.9 billion on R&D in China, which was a larger figure than in any other foreign country except for the United States (US; SEK 11.3 billion). Meanwhile, China was the foreign country with the largest number of R&D personnel, 6,796 people, among Swedish corporate groups. For comparison, the number of R&D personnel in the US was 5,239 people.[47]

As discussed above, it is attractive for foreign companies to gain access to Chinese technology, for instance through taking part in joint innovation with Chinese partners and contributing to higher-quality production in local manufacturing clusters, encouraged by the Chinese state and its “Made in China” ambitions. This is especially the case in industries where the Chinese industry has technological leadership, such as green technology and digitalisation. For companies in such industries, R&D activity in China can be crucial for their global strategies. Meanwhile, risks of intellectual property theft, that is, illicit technology transfer, are greater in strategic sectors where China is still focusing its efforts for self-reliance and technological leadership, such as semiconductors, telecom, AI, and quantum technology. The same is true for niches in other technology areas, for example, certain machinery and medical devices. The automotive industry contains examples of both strategic technologies for China, such as electric vehicle batteries, automotive semiconductors, and hydrogen fuel cells, and less strategic technologies, such as infotainment and internal combustion engines.[48]

For foreign companies with strategic technologies, limiting their corporate footprint in China by keeping core intellectual property and R&D at home, and by limiting interactions between global and Chinese operations to protect intellectual property, comes with disadvantages, including missing out on business opportunities. Meanwhile, Chinese competitors continue to receive government support to grow their domestic and international market shares, in some cases pushing

[46] Fan et al., *Business Climate Survey*, 26, 28, 38.

[47] Swedish Agency for Growth Policy Analysis, *Statistik 2023:06 Forskning och utveckling i internationella företag 2021* (Swedish Agency for Growth Policy Analysis, 2023), 28 September 2023, Appendix 1, https://www.tillvaxtanalys.se/download/18.eb7fc8818ad6889aac233e/1695880212505/Statistik%202023_06%20FoU%20i%20internationella%20f%C3%B6retag%202021.pdf.

[48] Groenewegen-Lau and Gunter, *The trade-offs,* 4, 7–8, 10, 12.

foreign companies out of the Chinese market. The comparatively scarce government support in Europe suggests that such companies, especially in industries such as telecom and green technologies, will eventually risk being outcompeted even at home. This is already a common occurrence in several industries, such as solar panels and electric vehicles.[49]

It might be unavoidable for companies to take a certain risk of undesired technology transfer, through continued technology exports and local innovation efforts, in order to remain competitive and to pursue new technologies in China that might impact on global competitiveness. However, Chinese controls that limit technology outflows also mean foreign companies might not always be able to put Chinese innovation to use beyond China's borders.[50] Overall, it is difficult to estimate the net impact on foreign companies' competitiveness of, on the one hand, innovation opportunities in China, and, on the other, potential long-term consequences from technology transfer to the Chinese industry, which in many cases is actively supported by the Chinese party-state.

Aside from Swedish companies with production in China, there are those which only deal in services or sales of goods. As for services, these include various forms of technical consultancy, for which a core element of the value proposition is the transfer of know-how. Through consultancy, professionals lawfully conduct legal technology transfer by sharing their experience-based knowledge of specific industries, technologies and production processes to various actors in China. However, depending on the circumstances, consultancy services that imply technical assistance for manufacturing or developing dual-use items may require export licences.[51]

The sale of technical goods is by definition a type of technology transfer, also within the boundaries of the law provided that export control regulations are adhered to. Illicit technology transfers occur only when products fall into the hands of unauthorised end-users, or are exploited in ways that violate contractual agreements, such as through reverse engineering that infringes on patents or copyrights.

It should also be noted that certain types of technology transfer can take place regardless of a company's type of business activity in China. A notable example is the potential transfer of technical know-how, whether industry-specific or at a more general level, associated with key personnel travelling between Sweden and China, participating, for example, in study visits, conferences, and business expositions. Transfer of know-how, or talent recruitment in a broader sense, can of course take place digitally as well, without being physically present in China. However, the transfer of know-how may also, depending on the circumstances,

[49] Ibid., 15–6.
[50] Ibid., 15–6.
[51] "Tekniskt bistånd," Swedish Inspectorate of Strategic Products, accessed 20 October 2025, https://isp.se/produkter-med-dubbla-anvandningsomraden/kontroll-av-ej-listad-pda/tekniskt-bistand.

fall within the scope of technical assistance and be subject to export authorisation.[52]

To some extent, all technical goods and services exported from Sweden to China, or produced and sold locally in China by Swedish companies, potentially contribute to China's industrial advancement. This, in turn, risks contributing to decreesed competitiveness for the Swedish and European industries and increased exposure to economic coercion from China, or further down the line, to benefit the Chinese defence industry. However, such an unrestrained perspective implies that all technology exports and sales are potentially undesired technology transfer. Taken to its extreme, this reasoning means that trade between democratic and authoritarian states, or between competing industries and governments overall, should not take place at all. De-risking is then unrecognisable from decoupling.

There is also the question of the potential counterproductiveness of extensive prohibitions on trade and investment, in terms of lost revenue for the foreign companies involved, and the breathing room created for Chinese competitors to grow stronger and claim domestic, and potentially international, market shares. Ongoing developments within the Chinese semiconductor industry, with Huawei spearheading efforts for China to break free from dependence on Western AI chips and the associated manufacturing equipment and other inputs, is a pertinent example.[53] Then again, depending on the products and their application, there might be short-term gains of restricting economic flows that trump potential long-term negative side effects. For instance, it can be a goal in and of itself to prevent flow of AI chips—not just manufacturing equipment—to China, in order to hamstring the country's computing capacity development and breakthroughs in advanced AI.

It seems unlikely that Swedish companies act directly as suppliers to the Chinese defence industry and military. For one, China prohibits foreign-owned companies from direct participation in its domestic defence market.[54] Moreover, Swedish export controls should act to prevent most direct transfers of military-grade technologies to China's defence contractors. Companies may also have their own due diligence measures to prevent reputational risks. The risk of indirect supplies of technology goods to companies in China, which in turn participate in domestic defence procurements, is probably more noteworthy. It is not necessarily the main focus of companies, whose purpose is to deliver value to customers and owners, to monitor indirect or unintended flows of goods and know-how to the Chinese

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[52] Swedish Inspectorate of Strategic Products, "Tekniskt bistånd."

[53] Eleanor Olcott, Zijing Wu, and Chris Cook, "Satellite images reveal Huawei's advanced chip production line in China," *Financial Times*, 4 May 2025, https://www.ft.com/content/afd618f8-12c9-4297-b2a9-49f7dc548da4.

[54] Marcel Angliviel de la Beumelle, Ben Spevack, and Devin Throne, *Open arms: Evaluating global exposure to China's defense-industrial base* (C4ADS, 2019), 28, https://c4ads.org/wp-content/uploads/2019/10/OpenArms-Report.pdf.

defence industry. Such extensive due diligence might not be realistic for many or most companies.

TSMC again serves as an example to illustrate the difficulties for companies in preventing indirect technology leakage. In 2024, there were allegations of TSMC's advanced chips ending up with Huawei, which is sanctioned by the US, through another Chinese customer, despite TSMC's measures to comply with export controls.[55] In its 2024 annual report, TSMC stated that "[Its] role in the semiconductor supply chain inherently limits its visibility and information available to it regarding the downstream use or user of final products that incorporate semiconductors manufactured by it," and that this "impedes [its] ability to fully ensure that semiconductors manufactured by it will not be diverted to unintended end use or end-user, including potentially by its business partners, or by third parties with an intent of circumvention."[56] This illustrates that even resource-rich companies like TSMC cannot fully prevent their products from falling into the wrong hands.

[55] Karen Freifeld, "Exclusive: TSMC could face $1 billion or more fine from US probe, sources say," *Reuters*, 9 April 2025, https://www.reuters.com/technology/tsmc-could-face-1-billion-or-more-fine-us-probe-sources-say-2025-04-08/.
[56] TSMC, *Annual Report 2024*, 12 March 2025, 142, https://investor.tsmc.com/sites/ir/annual-report/2024/2024%20Annual%20Report_E.pdf.

3 Mapping methodology

This chapter describes the study's methodology for mapping the business activities of Swedish companies in China and their supply-chain links to critical technology areas. First, the methodology is described in theory, before empirical testing. Second, we describe the empirical assessment of the methodology using open-source data.

3.1 Theoretical mapping methodology

The different stages of the theoretical mapping methodology are illustrated in Figure 1 below. This final version of the methodology is the result of successive improvement through empirical assessment.

Figure 1. The stages of the theoretical mapping methodology.

3.1.1 Identification and selection of companies

The first step of the mapping process is to identify and select companies, for study, with business activities in China. The methodology here relies on open-source data, and thus depends on publicly available lists of Swedish companies in China. At this stage of the mapping process, a decision needs to be made on whether to use a single list of companies as a starting point, or to combine multiple lists from different sources into one list, possibly adding individual companies. It also needs to be decided which companies are to be regarded as Swedish, and what companies are of interest to study given the context of critical technology areas.

Section 1.2.2 describes the definitions and delimitations made in this report with regard to the selected companies for the empirical study. The selection process is further described in Section 3.2.1 below.

3.1.2 Collection and assessment of company-specific data

Although the main goal of the suggested mapping methodology is to identify companies' supply-chain links to critical technology areas, it is useful to assemble information and describe the companies' general activities. This step is also crucial for the assessment of the risks associated with their business activities in China.

During this stage, the companies' activities are identified through their annual reports, webpages, and other sources of information. Collecting and analysing even openly available information, to provide a general description of companies and to understand their activities in China, is labour-intensive.

Table 3 provides a list of company-specific data that the authors judge to be especially important in the context of critical technology areas and technology transfer risks.

Table 3. Company-specific data for mapping.

Attribute	Description
Country of incorporation	Country of incorporation for the group parent company (Sweden or a foreign country).
Company name in China	Name of the company in China.
Group parent company	Name of group parent company.
Mode of entry in China	The company's mode of entry in China (e.g., merger, acquisition, joint venture, greenfield investment).
Ownership structure in China	Ownership structure for the company in China.
Global business activity[57]	The authors' estimation of the company's and/or group's global business activity.
Business activity in China[58]	The authors' estimation of the type of business activity the company has in China (production, services, sales of goods).
Industry classification[59]	The company's industry classification according to the study's own model.
Supply-chain links to the EU's critical technology areas[60]	The authors' estimation of the company's supply-chain links to the EU's critical technology areas.
Supply-chain links to China's critical technology areas[61]	The authors' estimation of the company's supply-chain links to China's critical technology areas.

[57] Identification of the companies' global business activity is part of the process for identifying their China-specific business activities, as described in Section 3.1.3.
[58] Identification and categorisation of the companies' business activities in China are described in detail in Section 3.1.3.
[59] The study's own industry classification is described in detail in Section 3.1.4.
[60] The list of the EU's critical technology areas can be found in Section 1.2.1 and the model for assessing supply-chain links between companies and critical technology areas in Section 3.1.5.
[61] The list of China's critical technology areas can be found in Section 1.2.1 and the model for assessing supply-chain links between companies and critical technology areas in Section 3.1.5.

3.1.3 Identification of business activity

At this stage, a selection of companies to study has been made, and their company-specific data have been collected. The next step in the process is to identify the companies' business activities in China.

Given that the context for this study is critical technologies, whose potential leakage abroad is associated with detrimental national security implications, it is, the authors argue, relevant to differentiate between the different types of local business activity by Swedish companies in China, and thereby different degrees of commitment and presence. To illustrate, some corporate groups only have sales offices in, for example, Beijing or Shanghai, while others have factories spread out across the country's provinces. From the perspective of assessing technology transfer risks, production activity is more interesting than sales of goods, and arguably more interesting than services.[62]

Consequently, this study divides the companies' business activities in China into the following three categories:

- Production (manufacturing, including design, R&D)
- Services (consulting, logistics, IT solutions, other services)
- Sales of goods (including marketing and market research, after-market services, and sourcing[63])

This categorisation entails at least two simplifications. Firstly, each company is assigned one (1) primary business activity that according to the assessment here best describes its operations in China, based on the level of commitment. The categories are thus, for present purposes, mutually exclusive. Production takes precedence over services, which in turn takes precedence over sales of goods. Naturally, a company that has production in China often also deals in sales of goods, and sometimes in services. However, whether or not the company has production is the primary question of interest here. Secondly, the grouping of specific business activities into three overarching categories is a simplification in itself. For example, manufacturing and R&D are in reality two separate and distinct business activities, but, are, for the sake of simplicity, treated here under the same grouping.

3.1.4 Industry classification

In addition to identification of business activity, it is relevant to classify the studied companies according to industry. A relevant question that may arise here is

[62] See Section 2.2 for a discussion on different types of exposure to legal and illegal technology transfer.

[63] Sourcing—that is, activities involving the maintaining of contact with suppliers in China to supply goods and services to third countries—does not clearly fall under sales of goods. However, very few of the studied companies are estimated to have sourcing as their sole operation in China, which justifies this simplification.

whether EU10 and MIC25 are not themselves sufficient as classification models; why have industry classification as an intermediary step? This study argues that this extra step is necessary to achieve an unprejudiced bottom-up mapping of the business activities of the studied companies. If EU10 and MIC25 are used as sole models for classification, there will be no way to provide an overview of, or differentiate between, the different companies whose business activities fall outside the critical technology areas. Moreover, as described in Section 3.1.5 below, the studied companies' supply-chain links to critical technology areas are assessed, when possible, based on specific products or services, which may entail designation as having supply-chain links to several critical technology areas at once. Meanwhile, an industry classification needs to consider the overall focus of the company's product and service portfolio. There are thus different analytical starting-points for industry classifications and for identifying a company's supply-chain links to critical technology areas.

Swedish Standard Industrial Classification (*Svensk näringsgrensindelning*, SNI) is a standardised system for classifying companies' business activities in Sweden. SNI codes are assigned, or self-selected by the companies, based on their specific business activity. However, industry classification according to SNI is insufficient for the purposes of this study. SNI enables consolidated reporting of the studied companies' industry classification at different levels of abstraction (2–5 digits), but it is difficult to find one single level that is suitable to clarify the link between the company's business activity and the critical technology areas. While SNI provides industry classification beyond the 2-digit level, it lacks usefulness, for example, all manufacturing falls under one broad category, hindering differrentiation between different types of high-technology manufacturing. Furthermore, many categories within the SNI system are simply irrelevant for the context of this study. Therefore, SNI is excluded from the proposed mapping methodology. However, an overview of SNI codes for the companies in the empirical study, as described in Section 3.2, is provided in Appendix A.

Consequently, this study employs its own industry classification model for the companies' business activity, inspired by an earlier FOI study on Chinese investments in Sweden.[64] The industry classification model is presented in Table 4, and is further elaborated on below.

[64] Almén, *Kinesiska investeringar i Sverige*.

Table 4. Study's industry classification model.

Agriculture and food industry
Automotive industry
Biotechnology
Business services
Construction industry and real estate
Electronics
Energy
Health and medical technology
Information and communication technology
Metalworking industry
Mineral industry
Other consumer goods and services
Other industrial products and machines
Transportation and infrastructure

Notably, this study has made some choices and interpretations that may differ from the reasoning behind the aforementioned FOI model. For instance, the starting point of this study is to base a company's industry classification on the direct value provided by its products and services. Among other things, this implies that if a company's products or services are mainly directed at a specific industry, the company itself is designated as belonging to the industry in question.

Furthermore, the categories used in this study do not entirely overlap with the original model due to changes made based on independent assessments. Specific changes to the categories used in the original (Swedish-language) FOI model are described here. Firstly, certain categories have been merged due to similarities in their business purpose and their relatively low relevance for the context of critical technology areas. These include Consumer goods, Travel and tourism, Entertainment, and Hotels and restaurants, which are here combined into *Other consumer goods and services*, and Construction industry and Real estate, which are here united into one category. Secondly, certain categories have been split up, based on the assessment that intra-category diversity needed to be emphasised further. These include Health and biotechnology, a category represented here by *Health and medical technology* and *Biotechnology*, respectively, and Industrial products and machines, which has here been split into *Metalworking industry* and *Other industrial products and machines*, respectively. Thirdly, Wood and paper industry has been removed as a category, and companies belonging to this industry are instead categorised as either *Other industrial products and machines*, *Other consumer goods and services*, or *Transportation and infrastructure*, depending on the type of wood and paper products involved and their intended use. Lastly, Finance and business services has been renamed *Business services* for the sake of simplicity, and Minerals has been renamed *Mineral industry*, to clarify the inclusion of products beyond raw minerals, such as equipment for their extraction and processing.

The following are high-level descriptions of each category used in this study:

- *Agriculture and food industry* includes products related to agriculture and livestock management, as well as food products, including food raw materials and packaging.
- *Automotive industry* includes vehicles and vehicle components, as well as metalworking machinery and telematics specific to the automotive industry.
- *Biotechnology* includes applications combining technology and biology, especially cell biology, such as genomics, biosensors, genetic modification, biopharmaceuticals, and bioinformatics.
- *Business services* cover a broad range of services, such as various consulting activities and financial services.
- *Construction industry and real estate* include construction activities, building materials, as well as real estate operations focused on leasing and management of commercial properties.
- *Electronics* includes various electronic components, including semiconductors, as well as equipment containing electronic components.
- *Energy* includes equipment for electricity production, related components and services, as well as electricity generation itself.
- *Health and medical technology* includes various systems, equipment, and tools for healthcare, healthcare services themselves, as well as non-biotech pharmaceuticals.
- *Information and communication technology* mainly refers to software, but also to software-centric hardware. Examples include software development and various equipment and systems for communication, data management and analysis, monitoring, and cybersecurity. AI and cloud computing are included as well.
- *Metalworking industry* includes processing and manufacturing of metals, production of various metal components, as well as machine tools and their components.
- *Mineral industry* includes mineral-related raw materials as well as equipment for their extraction and processing.
- *Other consumer goods and services* includes consumer goods not found in other categories, as well as services related to travel, tourism, entertainment, and the hotel and restaurant sector.
- *Other industrial products and machines* includes industrial production not covered by other categories, primarily various industrial inputs, components, and equipment with broad applications.
- *Transportation and infrastructure* includes transport services and related packaging solutions, warehousing, infrastructure, and associated equipment.

It should be noted that industry classification can involve a degree of arbitrariness, since some companies have close links to multiple industries at once, whether due to the breadth of their product portfolios, or due to their products and services contributing as important inputs to several different industries. During the course of this study, the principle has been to designate industry classifications based on the primary use area of each company's products and services.

3.1.5 Identification of supply-chain links to critical technology areas

The study's industry classification model described in Section 3.1.4 aligns better with the EU's and China's politically designated critical technology areas than SNI does, but there is still room for interpretation. Consequently, there is a need for personal assessments of the connection between Swedish companies' business activity in China and the EU's and China's critical technology areas. The technologies in focus for each company's business need to be considered, beyond its industry classification. As a simple example, companies in the automotive industry can implement advanced machine learning in their products or services.

This study emphasises the importance of a supply-chain perspective, and thus differentiates between different types and degrees of company links to critical technology areas. The companies' business activities can belong to different tiers within the supply chains of critical technology areas, and be more or less closely linked to specific technology areas. For instance, companies can be directly engaged in manufacturing, design, and R&D, either of end products or of industry-specific inputs and tools within the critical technology areas. Companies can also be connected to multiple critical technology areas at once. Moreover, there are companies that produce industry-transcending inputs or services, for instance, raw materials, components, machines, IT solutions or consultancy services of different kinds, which have both the critical industries and other industries as markets.

However, it can be difficult to determine the exact share of a given company's product portfolio and actual sales that can be linked to specific industries. In some cases, there is openly accessible data on the distribution of company sales, in aggregate or divided into different business areas, to different user industries. Unfortunately, this type of quantitative information is not always available. In such cases, the analysis has to be qualitative, examining how the company markets its products and services, including which downstream industries and applications it targets. The basic assumption is that a company does not market itself to a certain industry if it does not have products or services with utility for the industry in question. At the same time, it is probably also often the case that companies market themselves broadly, but in reality have more or less distinct niches.

If the majority of a company's sales end up in, or if the company markets its products exclusively to, a certain critical industry, the judgement here is to classify the company itself as belonging to the industry in question. If the company's sales or market positioning targets multiple downstream industries, including critical industries, without having a critical industry as a majority customer segment, it is identified as a supplier. This also includes cases where there is insufficient information to identify a majority customer industry.

There are also service companies that cater to most industries, including critical industries, without a specific industry bias. Lastly, there are companies whose products or services have no apparent ties to the critical technology areas.

In summary, based on the reasoning above, this study differentiates between companies' differing degrees of link to the critical technology areas, using four different categories:

1. **Critical Technology Company**: A company is designated as a Critical Technology Company if one of the following two conditions is true:
    a. The company manufactures or designs end products or their critical components within a critical technology area.
    b. The company, through one or more of its business areas, has a critical industry as a dominant customer segment, representing ≥50 per cent of total revenue, identified primarily through quantitative data, and secondarily through qualitative analysis of the company's positioning of its products and services.
2. **Supplier**: A company is designated as a Supplier if it provides inputs, equipment, tools, consulting or other services to multiple industries, **including** critical industries, without verifiably having a single critical industry as a dominant customer segment, representing ≥50 per cent of total revenue.
3. **General Services**: A company is designated as General Services if it performs business support services that are industry-agnostic, that is, are not closely tied to specific industries and thus are also applicable to companies in critical technology areas.
4. **Unrelated**: A company is designated as Unrelated when its business activities have no apparent links to critical technology areas.

3.2 Empirical assessment of the mapping methodology

This section outlines the specific choices made for the empirical study in this report, which evaluates the theoretical mapping methodology described above. It also includes examples that illustrate how the self-defined company attributes were designated.

3.2.1 Selection of companies for the empirical study

At the outset of the study, an initial list of names of Swedish companies in China was collected. The list consisted of names of companies listed on the Swedish Chamber of Commerce in China's website and in its member directory. The initial list was established in May 2024, followed by an update in February 2025. The update added 20 companies to the initial list, bringing the total to 207 companies. Companies that had disappeared from the Swedish Chamber of Commerce in China's member list during the period May 2024–February 2025 remained in the list.[65] During the mapping process, two inactive companies, 24 foreign-owned companies without ties to Sweden, and 14 Swedish-owned companies without business in Sweden were identified. The final list of Swedish companies with business in China that were mapped during this study contains a total of 167 companies: 118 companies belonging to Swedish corporate groups, and 49 belonging to foreign-owned corporate groups that also have subsidiaries in Sweden. The list of the 167 studied Swedish companies in China is provided in Appendix B.

Beyond Swedish companies, as defined in this study, the members of the Swedish Chamber of Commerce in China also include companies belonging to foreign corporate groups without a clear connection to Sweden, as well as companies in China that are, or appear to be, Swedish-owned but lack a base in Sweden. The latter are typically China-based companies, often consultancies or in the restaurant industry, founded by Swedish citizens. These two categories of companies are not included among the studied companies.

The studied companies represent a total of 155 different corporate groups, including both large and small companies, with great variety in numbers of subsidiaries, revenue and employees. The number of Swedish-owned corporate groups mapped herein is 110. This can be compared to the number of Swedish corporate groups with subsidiaries in China in 2022, provided by the Swedish Agency for Growth Policy Analysis, which was 257. The list of these 257 companies is not publicly available, due to the agency's confidentiality restrictions on sharing company-level data. However, it can be noted that the agency's number does not include all companies with business in Sweden that have foreign-owned group parent companies, since the agency defines as Swedish only the corporate groups whose group parent company has Swedish majority ownership.[66] That does not overlap entirely with the 45 foreign-owned corporate groups included in this study. In summary, a rough estimate is that this study has included slightly more than half of all Swedish-owned corporate groups with business in China. As the aim of this study is not to comprehensively map all Swedish companies in China, the number of studied companies is sufficient to assess the proposed methodology. Moreover, the analysis and discussion of the results of the empirical study in Chapters 4–5 are not contingent on whether the studied companies are representative of all Swedish companies in China.

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[65] Membership in the Chamber of Commerce is voluntary and requires a regular membership fee, which means that companies both join and leave continuously.

[66] Swedish Agency for Growth Policy Analysis, *Statistik 2024:05*, 12, 18.

3.2.2 Collection and assessment of company-specific data

Complementary information was added to the studied sample of companies through open and digitally available data from various sources. The general hierarchy of sources for the empirical study is as follows: Allabolag (a website that provides open information on companies registered in Sweden), annual and sustainability reports for 2023 and 2024, company websites, the Swedish Chamber of Commerce in China's website, and Chinese Baike.[67]

The Swedish Chamber of Commerce in China's member companies often represent larger corporate groups in China, with a number of different companies and their subsidiaries. This is apparent when browsing through annual reports and corporate structure information on Allabolag. It is also apparent from the company presentations on the Swedish Chamber of Commerce in China's website that member companies consisting of investment, holding, or trading companies often represent other production- or service-oriented companies in China, whose business activities need to be taken into consideration. As much of the information about the studied companies is derived from the aforementioned sources, which often provide information that covers entire corporate groups, this study has, to some extent, also studied the corporate groups as a whole. That is at least true for smaller corporate groups that only consist of one company and brand. For corporate groups consisting of several different companies and brands, the focus has been on those represented in the Swedish Chamber of Commerce in China.

The complementary information on the studied population of companies consisted of company attributes collected directly from the open sources and of attributes created from assembled pieces of information. The selection of attributes has been based partly on the level of access to comprehensive and comparable quantitative or qualitative data, partly on which attributes are deemed of greatest relevance given the focus of the study. The attributes that were collected directly include country of incorporation and group parent company. The attributes created through overall assessments are the company's global business activity and its business activity in China (see Section 3.1.3), industry classification using the study's own model (see Section 3.1.4), and the company's supply-chain links (see Section 3.1.5) to the EU's and China's critical technology areas, as represented here by EU10 and MIC25 (see Section 1.2.1). The attributes are described in Table 5.

The collection of complementary information has not been performed systematically, since the initial list contained a mix of companies at different organisational levels, including corporate groups, parent companies, subsidiaries, and units. Consequently, the collection of complementary data was initiated by an identification task to link the available name in the Swedish Chamber of

[67] Allabolag, https://www.allabolag.se/; Baike is a Chinese online encyclopaedia, see 百度百科 [Baidu Baike], https://baike.baidu.com/. There are Chinese websites similar to the Swedish Allabolag that provide information on companies, such as Tianyancha (天眼查), but with limited access to foreigners.

Commerce in China's member list with its corresponding corporate group, parent company, or subsidiary, depending on the organisational level of the initial name.

Table 5. Company-specific data in the empirical study.

Attributes	Description	Source
Country of incorporation	The country of incorporation for the group parent company (Sweden or a foreign country).	Allabolag
Company name	Name of the company in China.	Swedish Chamber of Commerce in China
Group parent company	Name of the group parent company.	Allabolag
Global business activity	The authors' estimate of the company's global business activity.	Self-created attribute
Business activity in China	The authors' estimate of the company's type of business activity in China (production, services, or sales of goods).	Self-created attribute
Industry classification	The company's industry classification according to the study's own model.	Self-created attribute
Supply-chain links to the EU's critical technology areas	The authors' estimate of the company's supply-chain links to the EU's critical technology areas.	Self-created attribute
Supply-chain links to China's critical technology areas	The authors' estimate of the company's supply-chain links to China's critical technology areas.	Self-created attribute

It should be noted that data on mode of entry and ownership structures in China, presented among the attributes of interest in Section 3.1.2, have not been successfully collected and assessed in the empirical study. During the course of the study, they were delimited due to a lack of easily accessible and comprehensive data. Mode of entry and ownership structure are important factors in the context of critical technologies, technology transfer risks, and China. However, Allabolag does not provide information on mode of entry nor on ownership structures for company subsidiaries in China, and company annual reports vary greatly in their level of detail.

Leaving the missing attributes aside, a unique database of Swedish companies with business in China has been established during the course of this study. The uniqueness of the database hinges on the study's own industry classification in combination with the identification of the companies' business activity in China and their links to the EU's and China's critical technology areas, based on an assessment of each individual company.

Assessment models for a company's business activity, industry classification, and supply-chain links to critical technology areas are described in Section 3.1 above.

The following is a general description of the information collection flow for the study's self-created attributes, based on the sources used in the empirical study.

As a first step, Allabolag is accessed. Corporate structure information, including the group parent company, is openly available on the website. Moreover, Allabolag provides 5-digit SNI codes for companies registered in Sweden, which provide some initial information on a company's business activity. However, SNI codes are usually missing for foreign subsidiaries, and the codes for the directly superior parent companies rarely appear to accurately reflect the operations conducted in China, not least since they often consist of holding companies.[68] Moreover, Chinese subsidiaries are not always listed in the corporate structure provided by Allabolag.

Consequently, as a second step, the companies' annual reports are analysed to identify business activities and product segments specific to operations in China. However, there are different types of annual reports. Some annual reports are part of formal reporting requirements to the Swedish Companies Registration Authority (*Bolagsverket*), and are made available on Allabolag. As a rule, these are largely quantitatively oriented and seldom contain sufficient information of use for this study's context. Comprehensive annual reports published by, for example, publicly listed companies or multinational corporate groups adhering to other international reporting standards, are much preferred. These often contain more detailed information regarding the company's product portfolio, customer segments, business strategy, and market analysis, among other things. However, this type of report is not available for all companies, especially smaller ones.

In a third step, company websites are reviewed for complementary information on the companies' product portfolios, customer industries, and business activities in China. However, as with annual reports, company websites vary greatly in their level of detail. In some cases, there is detailed information on products, offices, factories, and business partners tied specifically to the Chinese market, whereas in other cases only a high-level global overview of the company and its business activity is available. In many cases, Swedish companies in China have Chinese-language versions of their websites, but as a rule these are simply translations of the Swedish or English original. Experience from this study suggests that it is only in exceptional cases that Chinese-language company websites contain unique information about operations in China.

Finally, the information gathered from companies' annual reports and websites is complemented and verified, if possible, with the company descriptions made available on the Swedish Chamber of Commerce in China's website, and with public information on Baike.

[68] "70100 Activities of head offices" is a commonly-used industry classification for this type of parent company.

As for supply-chain links to critical technology areas specifically, there are certain methodological caveats in the empirical study worth noting. Even though there is open information on specific technologies, or at least examples thereof, covered by the critical technology areas of EU10 and MIC25, it is not always possible to map in detail which specific technologies are managed by the studied Swedish companies in China. Aside from the significant amount of time consumed by such assessments, the necessary information is not always openly available. In this study, assessments of company links to critical technology areas are made based on specific technologies when possible, but otherwise the assessments are made at the lowest level of abstraction possible. It is not stated whether each of the studied companies has technological leadership in its respective technology areas. Moreover, if it is not apparent through the open sources employed here which of a company's products or services are produced or sold in China, the assumption is that local business operations encompass the company's entire product portfolio.

Sections 3.2.3–3.2.5, below, illustrate how business activity, industry classification, and supply-chain links to critical technology areas have been designated, using some of the studied, major Swedish companies that are also listed on the Stockholm stock market as examples.[69]

3.2.3 Examples of business activity identification

Atlas Copco is a Swedish industrial company that produces various types of industrial machinery. It has four business areas, all of which have manufacturing and R&D in China.[70] Thus, its business activity in China is designated as **Production**.

Nordea, a bank with strong ties to Sweden, has had its headquarters in Finland since 2018. It is a financial services company that also has operations in Shanghai.[71] Nordea's business activity in China is herein designated as **Services**.

H&M is a "customer-focused global fashion and design group" that also sells its products in numerous stores and through e-commerce in China. H&M does not have factories in China (or elsewhere), but considers China to be one of its "key sourcing regions" for clothing, home to many of its tier-1 suppliers for its global business.[72] H&M's primary business activity in China is herein designated as **Sales of goods,** because it is not a service company and it lacks local production, apart from a design centre aimed at aligning products with local demand.

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[69] "OMX Stockholm 30," Avanza, accessed 26 June 2025, https://www.avanza.se/index/om-indexet.html/19002/omx-stockholm-30.

[70] Atlas Copco, *Annual Report 2024*, 20 March 2025, 2, 17, 22–9, https://www.atlascopcogroup.com/en/investors/reports-and-presentations.

[71] Swedish Chamber of Commerce in China, "Corporate Members."

[72] H&M, *H&M Group Annual & Sustainability Report 2024*, 20 March 2025, 4, 69, 88, 113, https://hmgroup.com/wp-content/uploads/2025/03/HM-Group-Annual-and-sustainability-report-2024.pdf; "Supply chain," H&M, accessed 1 July 2025, https://hmgroup.com/sustainability/leading-the-change/transparency/supply-chain/.

3.2.4 Examples of industry classification

Hexagon is a Swedish multinational company that "combines sensor, software, and autonomous technologies to transform the world's most vital industries."[73] Hexagon's Manufacturing Intelligence Group has a "comprehensive system for R&D, engineering, manufacturing and applications in hardware, software and manufacturing intelligence technology solutions" in Qingdao, China, and provides various tools for "quality assurance and process control to the manufacturing industry."[74] Hexagon's software-centred hardware solutions for smart manufacturing suggest it should be designated an **Information and communication technology** company.[75]

Assa Abloy is a Swedish "global leader in access solutions," and has several plants in China. Its products, which are adapted to fit local requirements, include "mechanical and electromechanical locks, hardware, and security doors," targeting industries such as construction, public transportation, and new energy vehicles.[76] Due to the broad scope of application of Assa Abloy's products, it is herein designated as belonging to **Other industrial products and machines**.

3.2.5 Examples of identifying supply-chain links to critical technology areas

AstraZeneca is a British-Swedish "global, science-led, patient-focused pharmaceutical business" that also engages in the areas of biomedicine and biotechnology. In addition to its innovation activities in, for instance, genomics and cell therapy, AstraZeneca has made various acquisitions of biotechnology companies in the last few years, including in China. Its business activities in China include two strategic R&D centres and two manufacturing sites, among other offices.[77] In summary, AstraZeneca's business activities in China suggest it should be designated as a **Critical Technology Company** with regard to EU10's category *Biotechnology* and MIC25's *Biomedicine and high-performance medical equipment*.

Alfa Laval is a Swedish company and a "global provider of first-rate products in the areas of heat transfer, separation and fluid handling." Alfa Laval has three busi-

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[73] Hexagon, *2024 Annual and Sustainability Report*, 27 March 2025, 3, 17, https://vp208.alertir.com/afw/files/press/hexagon/202503255363-1.pdf.

[74] Swedish Chamber of Commerce in China, "Corporate Members"; 关于海克斯康 ["About Hexagon"], Hexagon, accessed 1 July 2025, https://www.hexagonmi.com.cn/introduction.

[75] It could also be argued that Hexagon belongs to the category *Other industrial products and machines*.

[76] Assa Abloy, *Annual Report 2024*, 19 March 2025, 4, 7–8, 38–9, https://www.assaabloy.com/group/en/documents/investors/annual-reports/2024/Annual%20Report%202024.pdf.

[77] AstraZeneca, *What science can do: AstraZeneca Annual Report and Form 20-F Information 2024* (AstraZeneca, 2025), 13, 33, 193, https://www.astrazeneca.com/investor-relations/annual-reports/annual-report-2024.html; "Our Company," AstraZeneca, 6 February 2025, https://www.astrazeneca.com/our-company.html.

ness divisions, none of which represents a majority of company sales. Its customers include companies dealing in, for example, biotechnology, data centres, renewable energy, power generation, and shipyards.[78] Alfa Laval markets its equipment for use in many different applications, including nuclear power, hydrogen production, shipbuilding, data centre cooling, metalworking, and mining.[79] Alfa Laval has multiple manufacturing sites, service centres, and sales offices in China, and appears to sell all its product segments to the Chinese market.[80] In summary, Alfa Laval's business activities in China suggest it should be designated as a **Supplier**, with regard to (at least) EU10's categories *Artificial intelligence technologies, Biotechnologies, Energy technologies,* and *Advanced materials, manufacturing and recycling technologies*, as well as MIC25's *Next-generation information technology, Maritime engineering equipment and high-tech ships, Energy equipment,* and *Biomedicine and high-performance medical equipment*.

SEB is a Swedish bank with numerous offices overseas. In China, where SEB has been present for over 30 years, its offices in Beijing and Shanghai provide "a full range of corporate banking top-class services to Nordic, Baltic, and German clients."[81] SEB is herein designated as **General Services**, since it presumably also offers its services to companies in critical technology areas, even though most or all of its customers are non-Chinese, and its business in China is a small share of its global activities.[82]

Electrolux is a Swedish home appliance manufacturer with the full range of business activities in China, including manufacturing, R&D, sales of goods, and sourcing operations.[83] Its product offering includes kitchen appliances, laundry products, and well-being products for home consumer use.[84] Electrolux is herein designated as **Unrelated**, since its business activity in China (and globally) lack apparent ties to critical technology areas.

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[78] Alfa Laval, *Annual & Sustainability Report 2024*, 1 April 2025, 4, 53, 135, https://www.alfalaval.com/investors/publications/annual-reports/.

[79] "Industries," Alfa Laval, accessed 30 June 2025, https://www.alfalaval.com/.

[80] Alfa Laval, *Annual & Sustainability Report 2024*, 89; "Find your contact," Alfa Laval, accessed 30 June 2025, https://www.alfalaval.com/contact-us/?countryId=814&officeTypeId=0&zipcode=null&isFilter=true&toScroll=false.

[81] Swedish Chamber of Commerce in China, "Corporate Members."

[82] SEB, *Annual Report 2024*, 11 March 2025, 212, 223, https://sebgroup.com/annualreport.

[83] Swedish Chamber of Commerce in China, "Corporate Members"; Electrolux was recently, in July 2025, removed from the OMXS30 index, which is updated twice a year and lists the Stockholm stock exchange's most traded shares; see "Electrolux and Kinnevik Removed from Stockholm's OMXS30 Index," *Sweden Herald*, 23 June 2025, https://swedenherald.com/article/electrolux-and-kinnevik-removed-from-stockholms-omxs30-index.

[84] Electrolux Group, *Annual Report 2024*, 20 February 2025, 3, https://www.electroluxgroup.com/en/ab-electrolux-publishes-2024-annual-report-43521/.

4 Results of the empirical study

This chapter provides an overview of the empirical study and the 167 studied companies, in terms of their business activity, industry distribution using the study's own model, and supply-chain links to the EU's and China's critical technology areas.

4.1 Industry distribution

Table 6 presents the studied companies' industry distribution, based on the study's own model for industry classification and an assessment of the companies' type of business activity in China.

Table 6. Industry distribution for the studied companies.

Industry	**Production**	**Services**	**Sales of goods**	**Number of companies (share of total)**[85]
Agriculture and food industry	4	-	2	6 (3.6%)
Automotive industry	8	2	3	13 (7.8%)
Biotechnology	1	-	-	1 (0.6%)
Business services	-	21	-	21 (12.6%)
Construction industry and real estate	-	2	-	2 (1.2%)
Electronics	5	-	-	5 (3.0%)
Energy	1	2	-	3 (1.8%)
Health and medical technology	4	1	1	6 (3.6%)
Information and communication technology	2	9	4	15 (9.0%)
Metalworking industry	10	-	5	15 (9.0%)
Mineral industry	2	-	1	3 (1.8%)
Other industrial products and machines	18	2	11	31 (18.6%)
Other consumer goods and services	14	6	18	38 (22.8%)
Transportation and infrastructure	1	5	2	8 (4.8%)
Sum of companies (share of total)	**70 (41.9%)**	**50 (30.0%)**	**47 (28.1%)**	**167 (100%)**

[85] Percentages have been rounded to one decimal place.

The account in Table 6 above indicates that there are more companies with production among the studied companies than there are companies with only services or sales of goods in China. However, if services and sales of goods are counted together, companies without production facilities in China outnumber those that have local production.

The single most common industry, based on the study's own industry classification, for the studied companies in China is *Other consumer goods and services*, closely followed by *Other industrial products and machines*, and *Business services*. A common feature for these categories is that they represent diverse products and services. Among the more precise categories, *Information and communication technology*, *Metalworking industry*, and *Automotive industry* have strong representation.

Some industries, such as *Electronics* and *Metalworking industry,* are especially characterised by a large share of the studied companies having production in China. Other industries are characterised by a large share of companies with pure services or sales of goods, that is, a lack of local production in China. Except for *Business services,* which exclusively consists of different kinds of services, this includes *Other consumer goods and services*, where more than half of the studied companies do not appear to have their own production in China. *Information and communication technology* is also an industry with a high share of the studied companies without production in China.

4.2 Supply-chain links to critical technology areas

This section presents the results regarding the studied companies' supply-chain links to critical technology areas. As noted earlier, a company may be linked to several technology areas simultaneously. Tables 7–10 below therefore account for both the number of unique companies and the number of company links, and individual companies may be represented in numbers for several different technology areas at once. The numbers of unique companies among total company links are derived from the authors' underlying dataset.

Among the 167 studied companies, 45 (26.9 per cent) and 54 (32.3 per cent) unique companies, respectively, have been designated as Critical Technology Companies for the EU and China. However, the number of links is greater than the number of unique companies, since some companies are engaged in multiple critical technology areas simultaneously. In total, 62 and 71 links, respectively, to EU10 and MIC25 have been identified among the studied companies. More Critical Technology Companies have production in China than not, which contrasts with the overall pattern among the studied companies. Tables 7 and 8, below, give detailed breakdowns of the distribution by different critical technology areas and types of business activity.

Table 7. EU10 Critical Technology Companies among the studied companies.

Technology area	**Production**	**Services**	**Sales of goods**	**Number of companies (share of total)**
Advanced semiconductor technologies	5	-	-	5 (3.0%)
Artificial intelligence technologies	2	6	2	10 (6.0%)
Quantum technologies	-	-	-	-
Biotechnology	2	-	-	2 (1.2%)
Advanced connectivity, navigation and digital technology	7	2	3	12 (7.2%)
Advanced sensing technology	2	-	1	3 (1.8%)
Space and propulsion technology	-	-	-	-
Energy technologies	5	3	-	8 (4.8%)
Robotics and autonomous systems	4	1	-	5 (3.0%)
Advanced materials, manufacturing and recycling technologies	11	-	6	17 (10.2%)
Sum of company links	**38**	**12**	**12**	**62**
Sum of unique companies (share of total)	**25 (15.0%)**	**10 (6.0%)**	**10 (6.0%)**	**45 (26.9%)**

Table 8. MIC25 Critical Technology Companies among the studied companies.

Technology area	**Production**	**Services**	**Sales of goods**	**Number of companies (share of total)**
Next-generation information technology	10	6	3	19 (11.4%)
High-end computerized machines and robots	5	-	4	9 (5.4%)
Aviation and space equipment	1	-	-	1 (0.6%)
Maritime engineering equipment and high-tech ships	2	1	-	3 (1.8%)
Advanced railway transportation equipment	2	-	-	2 (1.2%)
Energy-saving and new energy vehicles	9	2	1	12 (7.2%)
Energy equipment	3	3	-	6 (3.6%)
Agricultural machinery	1	-	-	1 (0.6%)
New materials	10	-	1	11 (6.6%)
Biomedicine and high-performance medical equipment	5	1	1	7 (4.2%)
Sum of company links	**48**	**13**	**10**	**71**
Sum of unique companies (share of total)	**33 (19.7%)**	**11 (6.6%)**	**10 (6.0%)**	**54 (32.3%)**

A common technology area among MIC25 Critical Technology Companies is *Next-generation information technology*, representing 19 (35.2 per cent) of 54 unique Critical Technology Companies, corresponding to 11.4 per cent of studied companies. This category approximately corresponds to EU10's *Advanced semi-conductor technologies*, *Artificial intelligence technologies*, *Quantum technologies*, *Advanced connectivity, navigation and digital technology*, and *Advanced sensing technology*. These five categories, with the notable exception of *Quantum technology*, have in total involved 21 (46.7 per cent) of 45 unique EU10 Critical Technology Companies, or 12.6 per cent of studied companies. Technologies involved include AI solutions and related services for different types of data analysis, cloud computing, semiconductors (e.g., radio frequency and application-specific integrated circuits) and printed circuit boards, telecom equipment (e.g., radio access networks), connectivity solutions (e.g., cabling, network solutions), software for cybersecurity, and sensors (e.g., for industrial Internet of Things). It is common for companies to be involved in several of these five EU10 technology areas simultaneously, exemplified by companies that design both semiconductor components and telecom equipment in parallel, or producers of AI-based cyber-security technology.

Moreover, there are many Critical Technology Companies that fit the EU10 critical technology areas *Advanced materials, manufacturing and recycling technologies* and *Robotics and autonomous systems*, approximately corresponding to MIC25's *New materials* and *High-end computerised machines and robots*.[86] These critical technology areas involve 20 (44.4 per cent) out of 45 unique EU10 Critical Technology Companies, and 17 (31.5 per cent) out of 54 unique MIC25 Critical Technology Companies. This corresponds to 12.0 and 10.2 per cent of studied companies, respectively. Typically, these companies engage in products and services related to metal processing and lathe machining (e.g., of steel, aluminium), composite materials, different types of machine tools and processing equipment (e.g., precision grinders, high-pressure equipment), software and equipment for industrial automation (e.g., control systems, industrial robots and their components), and mining technologies. It should also be noted that industrial automation technologies overlap partly with MIC25's *Next-generation information technology* and the related EU10 technology areas, as industrial automation and smart manufacturing go hand in hand with, for example, advanced data analysis and industrial Internet of Things.

There are Critical Technology Companies among the studied companies in other technology areas as well. In relation to the EU10 *Energy technologies*, there are Swedish companies in China that have production of or provide services related to systems and components for wind power, solar power, hydrogen fuel cells, battery

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[86] EU10's *Robotics and autonomous systems* also includes companies from the automotive industry engaged in the production of autonomous vehicles. These often overlap with MIC25's *Energy-saving and new energy vehicles*, as they typically involve electric autonomous vehicles.

technology, power electronics, and charging infrastructure for electric vehicles. This largely overlaps with MIC25's *Energy equipment* and *Energy-saving and new energy vehicles.* A notable difference is that this study has interpreted only electric vehicle batteries and "smart grids," not electric vehicles themselves, as part of the EU's critical technology areas, whereas electric vehicles are included in MIC25. This means that there are several among the studied companies within the *Automotive industry*, involved in for instance production of electric vehicles or automotive components, or providing automotive-related technical consultancy services, that are designated Critical Technology Companies with regard to MIC25 but not EU10. Some of the studied companies have operations in autonomous vehicles, which are here sorted under MIC25's *Energy-saving and new energy vehicles* and EU10's *Robotics and autonomous systems,* respectively.

In relation to EU10's *Biotechnology*, there are companies engaged in genomics and biosensors. No examples of companies or products belonging to *Space and propulsion technology* have been identified.[87]

As for MIC25's other technology areas, the following products have been identified among the studied companies: aviation electronics (*Aviation and space equipment*); marine engines, equipment for fluid management, ship design (*Maritime engineering equipment and high-tech ships*); propulsion, control, and connection systems for trains (*Advanced railway transportation equipment*); equipment for animal husbandry (*Agricultural machinery*); and pharmaceutical products and various medical equipment, for example, magnetic resonance imaging machines and mechanical ventilators (*Biomedicine and high-performance medical equipment*).

Moreover, a significant number of the studied companies are Suppliers to companies engaged in critical technology areas. 39 (23.4 per cent) and 41 (24.6 per cent) of unique companies, respectively, have been identified as Suppliers to EU10 and MIC25. In total, 80 links to EU10 and 147 links to MIC25 have been identified among the Suppliers. Tables 9 and 10, below, give a detailed breakdown of the distribution between critical technology areas and type of business activity.

[87] Propulsion technology for trains, which appears in the studied companies' product portfolios, has not been considered a critical technology for the EU in this report.

Table 9. EU10 Suppliers among the studied companies.

Technology area	Production	Services	Sales of goods	Number of companies (share of total)
Advanced semiconductor technologies	7	4	1	12 (7.2%)
Artificial intelligence technologies	6	2	1	9 (5.4%)
Quantum technologies	-	-	-	-
Biotechnology	1	-	-	1 (0.6%)
Advanced connectivity, navigation and digital technology	4	5	3	12 (7.2%)
Advanced sensing technology	-	-	-	-
Space and propulsion technology	-	-	-	-
Energy technologies	11	3	1	16 (9.0%)
Robotics and autonomous systems	-	2	-	2 (1.2%)
Advanced materials, manufacturing and recycling technologies	14	4	11	30 (17.4%)
Sum of company links	**43**	**20**	**17**	**80**
Sum of unique companies (share of total)	**18 (10.8%)**	**9 (5.4%)**	**12 (7.2%)**	**39 (23.4%)**

Table 10. MIC25 Suppliers among the studied companies.

Technology area	Production	Services	Sales of goods	Number of companies (share of total)
Next-generation information technology	12	6	3	21 (12.6%)
High-end computerised machines and robots	6	2	6	14 (8.4%)
Aviation and space equipment	5	3	3	11 (6.6%)
Maritime engineering equipment and high-tech ships	5	1	4	10 (6.0%)
Advanced railway transportation equipment	6	1	5	12 (7.2%)
Energy-saving and new energy vehicles	12	6	7	25 (15.0%)
Energy equipment	11	3	10	24 (14.4%)
Agricultural machinery	4	-	3	7 (4.2%)
New materials	5	2	7	14 (8.4%)
Biomedicine and high-performance medical equipment	5	2	2	9 (5.4%)
Sum of company links	**71**	**26**	**50**	**147**
Sum of unique companies (share of total)	**18 (10.8%)**	**9 (5.4%)**	**14 (8.4%)**	**41 (24.6%)**

More than half of Suppliers to EU10 and MIC25 among the studied companies have the industry classification *Other industrial products and machines*. A large share of these Suppliers' products consists of various intermediate inputs, with broad use in more or less advanced industrial manufacturing, including the critical technology areas for the EU and China. More specifically, the products include specialised industrial components (e.g., pipes, screw joints, springs, bearings, and seals) in different types of processed metal, or in plastic and rubber, but also processed and unprocessed raw materials (e.g., iron ore and powder), IT solutions (e.g., ERP systems, quality control software), different types of air purification and ventilation solutions, pressure and flow control equipment, and industrial safety solutions. Many of the associated companies could be referred to as suppliers of inputs to smart manufacturing. Among the identified Suppliers, there are also companies that provide specialised packaging solutions for specific industries and products, or consultancy services based on sector-specific technical competence.

In addition to the catch-all list above, which covers the majority of products and services that associate the identified Suppliers with EU10 and MIC25, there are examples of Suppliers with more niche product offerings for certain industries (but not any single industry). MIC25's *Energy-saving and new energy vehicles* is a good example. Various products and services provided by the studied companies have utility for all kinds of vehicles, including electric vehicles, among their other uses. These include, for instance, certain chemicals, materials, industrial components, fasteners, or electrical equipment specialised for the needs of the automotive industry.

The scope of the critical technology areas, especially MIC25, is broad enough to encompass a very large share of industrial production overall, which means many companies will have links in one way or another. This is part of the explanation for the 147 Supplier links to MIC25 among 41 unique companies. The majority of a company's business activity can be entirely unrelated, for instance focusing on consumer goods, while a certain business area or product segment within the company relates to a critical technology area. One example is a company here classified as *Other consumer goods and services*, but which also has business activities in AI and advanced data analysis, potentially with multiple application areas beyond the company's industry classification. Another example is a company categorized as belonging to *Agriculture and food industry* that applies seemingly advanced *Biotechnology* in certain of its products. A third example is another company with the industry classification *Other consumer goods and services*, but which also has certain business activity in innovative materials for battery technology. However, the company in question conducted the related production outside China and was therefore not designated as a Critical Technology Company or Supplier.

Besides Critical Technology Companies and Suppliers, 15 (9.0 per cent) of the studied companies have been identified as General Services, with weak but existing links to the critical technology areas. Examples include language education, translation, financial services, recruitment, general logistic services, and business strategy consultancy. While these companies seldom market themselves specifically to companies in the critical technology areas, unlike, for instance, technical consultants or suppliers of special transports, it can be assumed that Critical Technology Companies are represented among their customers.

Lastly, a significant share of the studied companies, 68 (40.7 per cent), with regard to EU10, and 57 (34.1 per cent), with regard to MIC25, are herein designated as Unrelated, suggesting their links to the critical technology areas are non-existent, or at least far-fetched. Examples of products and services range from e-commerce in food products and the production of clothes and lighting fixtures, to healthcare for kidney patients, real estate services, and interior design.

The industry distribution for the studied companies and their different supply-chain links to EU10 and MIC25 are broken down in Tables 11 and 12 below.

Table 11. Industry distribution vs. supply-chain links to EU10 critical technology areas.

Industry	**Critical Technology Company**	**Supplier**	**General Services**	**Unrelated**	**Sum of companies** (share of total)
Agriculture and food industry	1	-	-	5	**6 (3.6%)**
Automotive industry	5	1	-	7	**13 (7.8%)**
Biotechnology	1	-	-	-	**1 (0.6%)**
Business services	2	4	14	1	**21 (12.6%)**
Construction industry and real estate	-	-	-	2	**2 (1.2%)**
Electronics	5	-	-	-	**5 (3.0%)**
Energy	3	-	-	-	**3 (1.8%)**
Health and medical technology	-	-	-	6	**6 (3.6%)**
Information and communication technology	10	4	-	1	**15 (9.0%)**
Metalworking industry	10	5	-	-	**15 (9.0%)**
Mineral industry	1	2	-	-	**3 (1.8%)**
Other industrial products and machines	6	21	-	4	**31 (18.6%)**
Other consumer goods and services	1	-	-	37	**38 (22.8%)**
Transportation and infrastructure	-	2	1	5	**8 (4.8%)**
Sum of companies (share of total)	**45 (26.9%)**	**39 (23.4%)**	**15 (9.0%)**	**68 (40.7%)**	**167 (100%)**

Table 12. Industry distribution vs. supply-chain links to MIC25 critical technology areas.

Industry	Critical Technology Company	Supplier	General Services	Unrelated	Sum of companies (share of total)
Agriculture and food industry	1	-	-	5	**6 (3.6%)**
Automotive industry	13	-	-	-	**13 (7.8%)**
Biotechnology	1	-	-	-	**1 (0.6%)**
Business services	1	4	14	2	**21 (12.6%)**
Construction industry and real estate	-	-	-	2	**2 (1.2%)**
Electronics	5	-	-	-	**5 (3.0%)**
Energy	3	-	-	-	**3 (1.8%)**
Health and medical technology	3	-	-	3	**6 (3.6%)**
Information and communication technology	10	5	-	-	**15 (9.0%)**
Metalworking industry	9	6	-	-	**15 (9.0%)**
Mineral industry	1	2	-	-	**3 (1.8%)**
Other industrial products and machines	6	22	-	3	**31 (18.6%)**
Other consumer goods and services	1	-	-	37	**38 (22.8%)**
Transportation and infrastructure	-	2	1	5	**8 (4.8%)**
Sum of companies (share of total)	**54 (32.3%)**	**41 (24.6%)**	**15 (9.0%)**	**57 (34.1%)**	**167 (100%)**

Tables 11 and 12, above, show that all *Electronics*, *Energy*, and *Biotechnology* companies, and a majority of *Information and communication technology* and *Metalworking industry* companies, have been designated as Critical Technology Companies for both the EU and China. Also, with respect to MIC25, all *Automotive industry* companies have been designated as Critical Technology Companies. Meanwhile, none of the companies with the industry classification *Health and medical technology* have been designated as EU10 Critical Technology Companies or Suppliers, whereas half of them (3 companies) have been classified as MIC25 Critical Technology Companies. Moreover, only 1 out of 6 *Agriculture and food production* companies and 1 out of 38 *Other consumer goods and services* companies have been classified as Critical Technology Companies for the EU and China. No companies within *Construction industry and real estate* or *Transportation and infrastructure* have been designated as Critical Technology Companies.

Although it has not been the focus of this study, it bears mentioning that there are many examples of companies among those studied that identify the defence industry as one of their downstream industries and customer segments. This is not surprising for Critical Technology Companies or Suppliers, seeing as many of the critical technology areas are characterised by dual-use applications. However, the possibility of Swedish companies selling dual-use products and services directly to the Chinese defence industry is probably low, due to Swedish export controls, the companies' reputational risk management, and Chinese domestic regulations. Meanwhile, the ability to sell products and services to Chinese companies in, for instance, the semiconductor industry, telecommunications, machinery industry, chemical industry, and other industries that potentially provide supplies to the defence industry is not equally circumscribed.

5 Discussion and conclusion

This chapter discusses the results of the empirical study and thereafter presents the study's conclusions by addressing the research question:

> *How can we map the business activities of Swedish companies in China and their supply-chain links to critical technology areas using open-source data?*

5.1 Discussion

First of all, it should be emphasised that the empirical study in this report does not provide an all-encompassing mapping of Swedish companies with business activity in China. The empirical study also contains a number of companies that may not normally be defined as Swedish, but which have been included here due to their ties to Sweden and the study's context of technology-transfer risks. Any conclusions drawn from the results in Chapter 4 and the discussion here that concern the distribution of companies between different focal business activities, industries, and supply-chain links to critical technology areas are thus limited to the studied sample of companies.

Among the 167 studied companies, the aggregate assessment of their business activities is that 70 (41.9 per cent) have production in China, 50 (30.0 per cent) provide only services, and 47 (28.1 per cent) only deal in sales of goods. The single most common industry, based on the study's own model for industry classification, among the studied Swedish companies with business in China is *Other consumer goods and services*, closely followed by *Other industrial products and machines*, and *Business services*. Other industries with strong representation among the studied companies include *Information and communication technology, Automotive industry,* and *Metalworking industry*. This is not surprising, since these represent big industries in Sweden as well.

Some industries are especially characterised by a high proportion of the studied companies producing in China. For instance, this is the case for *Electronics* and *Metalworking industry*. At the same time, other industries are characterised by a large share of companies that only deal in services or sales of goods, that is, no local production. Except for *Business services*, which exclusively consists of different types of services, it includes *Transportation and infrastructure, Other consumer goods and services*, and *Information and communication technology*. It is surprising that a low share of companies within *Other consumer goods and services* have local production, since this category consists of various products that are potentially cost-effective to manufacture in China. The service and sales focus among the *Information and communication technology* companies indicates a relatively large focus on IT solutions and software sales, not hardware production.

Meanwhile, a subset of industries, including *Electronics, Energy, Biotechnology, Information and communication technology*, and *Metalworking industry*, consist almost exclusively of companies that have here been designated as Critical Technology Companies or Suppliers (see Tables 11 and 12, Section 4.2). Meanwhile, other industries, notably *Other consumer goods and services, Agriculture and food products*, and *Construction industry and real estate* are largely decoupled from the critical technology areas.

Moreover, some companies clearly belong to a certain industry, while at the same time being engaged in multiple EU10 and/or MIC25 technology areas at once. However, industry classification does not necessarily overlap with supply-chain links to critical technology areas. There are examples of companies among those studied that have a majority of business activity unrelated to the critical technology areas, but which have individual product segments or technology applications that match EU10 and/or MIC25. Part of the reason behind this is that the critical technology areas, especially MIC25, cover such a large share of industrial production overall, including multiple tiers of industries, that many companies with diverse product offerings become implicated one way or another.

The result of the empirical study suggests that there are many companies with supply-chain links to the critical technology areas, but also that the degree of ties can differ considerably. Breakdowns of the studied companies' supply-chain links to the EU's and China's critical technology areas are provided in Tables 13 and 14, below. Tables 15 and 16 break down the business activities of the companies with links to EU10 and MIC25, respectively. Lastly, Table 17 highlights the studied companies' links to the four most critical technology areas for the EU.

Table 13. Breakdown of the studied companies' supply-chain links to EU10.

Category	**Number of unique companies** **(share of total)**
Critical Technology Companies	45 (26.9%)[88]
Suppliers	39 (23.4%)[89]
General Services	15 (9.0%)
Unrelated	68 (40.7%)
Sum of companies	**167**

[88] The corresponding number of company links is 62.
[89] The corresponding number of company links is 80.

Table 14. Breakdown of the studied companies' supply-chain links to MIC25.

Category	**Number of unique companies (share of total)**
Critical Technology Companies	54 (32.3%)[90]
Suppliers	41 (24.6%)[91]
General Services	15 (9.0%)
Unrelated	57 (34.1%)
Sum of companies	**167**

Table 15. Breakdown of business activities for companies linked to EU10.

Type of business activity	**Critical Technology Companies (share of total)**	**Suppliers (share of total)**
Production	25 (55.6%)	18 (46.2%)
Services	10 (22.2%)	9 (23.1%)
Sales of goods	10 (22.2%)	12 (30.8%)
Sum of companies	**45**	**39**

Table 16. Breakdown of business activities for companies linked to MIC25.

Type of business activity	**Critical Technology Companies (share of total)**	**Suppliers (share of total)**
Production	33 (61.1%)	18 (43.9%)
Services	11 (20.4%)	9 (22.0%)
Sales of goods	10 (18.5%)	14 (34.1%)
Sum of companies	**54**	**41**

Table 17. Supply-chain links to the EU's most critical technology areas among studied companies.

Technology area	**Critical Technology Companies (share of total)**	**Suppliers (share of total)**
Advanced semiconductor technologies	5 (3.0%)	12 (7.2%)
Artificial intelligence technologies	10 (6.0%)	9 (5.4%)
Quantum technologies	-	-
Biotechnology	2 (1.2%)	1 (0.6%)
Sum of unique companies (share of total)	**16 (9.6%)**[92]	**16 (9.6%)**[93]

[90] The corresponding number of company links is 71.
[91] The corresponding number of company links is 147.
[92] The corresponding number of company links is 17.
[93] The corresponding number of company links is 22.

The results in Tables 13–17 above suggest that there are more Unrelated companies than there are Critical Technology Companies among the studied companies, while a slight majority (50.3 per cent and 56.9 per cent, respectively, for the EU and China) are either Critical Technology Companies or Suppliers. Moreover, a majority of Critical Technology Companies, and a large share of Suppliers, have production in China. Finally, and importantly, it is only a small minority of the studied companies that are engaged in the four technology areas that the European Commission identified as the most critical.

During the course of this study, the links between the studied companies and the critical technology areas have not always been analysed in depth because of a lack of open data. Consequently, the present analysis does not suggest that all the identified Critical Technology Companies and Suppliers are necessarily active in the specific niches within the critical technology areas judged more critical than others for the EU and China, but only that there are apparent links at some level of abstraction. Moreover, while some of the studied companies could likely claim to have technological leadership in their respective industries or niches, contributing leading-edge technologies within the Chinese industry, it is also likely that some companies are not technological leaders. Part of the issue is inflation in the companies' usage of certain popular technology concepts in annual reports and on their websites. For example, many of the studied companies identify AI, advanced data analysis, and the Internet of Things as being among their core competencies, but there is likely to be considerable variation in sophistication and the share of total business activity of the identified technologies, depending on the company in question. However, it can be difficult to separate the wheat from the chaff based only on open information and the companies' self-descriptions. Likewise, many of the studied companies claim to be involved in "advanced metals," and "complex" or "autonomous" machines. In some cases, these key words are probably fitting, but in other cases, it can be difficult to distinguish advanced technologies from marketing jargon. In summary, more fine-grained analysis of the companies' specific products and their technical specifications would be required to determine the degree of technology leadership and dual-use applicability, for example, in an export-control or investment screening decision-making context. This would also require data that is not open-source.

On the other hand, some of the studied companies may have a more important role in the critical technology areas than estimated in this study. An example is injection moulding of plastic components, which has here been classified under either the Supplier or Unrelated categories, but which could perhaps be described as an advanced and critical manufacturing technology. There are also examples of technologies that may not be emphasised in EU10 or MIC25, but are still subject to competition and trade friction between the EU and China. Examples include electric vehicles and automotive components, which in this study have not been treated as belonging to the EU's critical technology areas, despite the significance of electric vehicles for EU-China trade relations.[94] Another example is medical technology, which in this study has only been treated as part of MIC25, not EU10. However, in June 2025, the European Commission took measures to limit Chinese involvement in public procurement of medical technology within the Union, citing discrimination against European companies within the sector in China.[95] China soon responded with import restrictions on EU medical-device makers.[96]

Moreover, the analysis herein does not, for reasons of delimitation, have a sufficiently broad scope to encompass all potential links *between* the different technology areas, despite their interconnectedness through upstream and downstream supply-chain dependencies. Some important examples are semiconductor technology, various materials, and manufacturing software and equipment; their scope of application in advanced industrial production is broad and could encompass many of the other critical technology areas. China's tech industry is itself a great example of the synergies associated with overlapping industries, where companies leverage their strengths in one technology area to benefit another. For example, the Chinese AI and autonomous and electric-vehicle industries benefit from Huawei's advances in semiconductor technology, while Chinese shipbuilders and green technology (solar, wind) producers draw on industrial robots from domestic companies such as Inovance and Siasun to automate their production.[97] In summary, the analysis in this study gives an initial overview, but there remains potential for further investigation to identify the true scope of links between the studied companies and critical technology areas.

It might sometimes seem far-fetched to designate certain companies as Suppliers to companies in critical technology areas. For example, systems for advanced industrial air purification or cooling might not immediately evoke associations with critical technologies. Yet, these are examples of equipment that are crucial inputs to, for instance, semiconductor manufacturing and data centres for high-performance computing. Likewise, industrial components in different shapes and materials serve as crucial inputs to various industries, and their production can at times require advanced manufacturing capabilities. It is important to recognise that supply chains for advanced technologies are often very complex, involving many suppliers in multiple tiers for the different inputs, equipment, and refining processes necessary for manufacturing the end product. A famous example is the

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[94] See, for example, "EU Commission imposes countervailing duties on imports of battery electric vehicles (BEVs) from China," European Commission, 12 December 2024, https://trade.ec.europa.eu/access-to-markets/en/news/eu-commission-imposes-countervailing-duties-imports-battery-electric-vehicles-bevs-china.

[95] "Commission restricts Chinese participation in medical devices procurement," European Commission, 20 June 2025, https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1569.

[96] "China retaliates against EU ban with import restrictions on medical devices," *Reuters,* 7 July 2025, https://www.reuters.com/business/healthcare-pharmaceuticals/china-restricts-eu-imports-medical-devices-2025-07-06/.

[97] Kyle Chan, "China's overlapping tech-industrial ecosystems," *High Capacity* (blog), 22 January 2025, https://www.high-capacity.com/p/chinas-overlapping-tech-industrial.

Dutch company ASML's most advanced lithography machines, which are said to require 100,000 components from 5,000 different suppliers, in which each individual supplier may seem insignificant, but together they provide the necessary means to produce one of the most significant machines for advanced (semiconductor) manufacturing in existence.[98]

While the results of this study indicate that it is relevant to study and analyse critical technology areas from a broader supply-chain perspective, and not just with a focus on advanced end products, it remains an open question whether existing laws, regulations, and company policies efficiently manage risks pertaining to technology transfer. However, it should be emphasised that those Swedish companies that have direct or indirect business presence in China in the critical technology areas, including specific technology niches, have increased exposure to risks associated with the self-reliance ambitions of the Chinese state. This includes both discriminatory buy-local requirements that exclude foreign-owned companies and attempts to legally or illegally acquire their technology by Chinese actors across the system. It should also be emphasised that a majority of the designated Critical Technology Companies among the studied Swedish companies have production in China, which suggests increased exposure to risks of technology transfer.

During the course of this study, while going through company annual reports, it was apparent that there is a widespread awareness among the studied companies concerning the relationship between geopolitics and doing business in China. This is unsurprising, given that it is the companies themselves that experience the direct brunt of, for example, trade tensions between the US and China, or industrial policy and technology protection efforts in China and the EU. Many of the studied companies recognise, in their annual reports, the risks associated with being too dependent on Chinese supply chains, and the need for diversification of production bases, suppliers, and markets. Some companies also describe their efforts to monitor risks associated with human rights violations tied to Chinese supply chains, especially for suppliers and subcontractors with business activity in, for instance, the Xinjiang province.

5.2 Conclusion

During the course of this study, a combination of open sources and categorisation models has been used to map the business activities of a selection of Swedish companies in China, as part of the empirical study for assessing and improving the methodological approach. Piecing together information from different open

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[98] Antonio Varas, Raj Varadarajan, Jimmy Goodrich, and Falan Yinug, *Strengthening the Global Semiconductor Supply Chain in an Uncertain Era* (Boston Consulting Group and Semiconductor Industry Association, 2021), 29–30, https://www.semiconductors.org/wp-content/uploads/2021/05/BCG-x-SIA-Strengthening-the-Global-Semiconductor-Value-Chain-April-2021_1.pdf.

sources provides a basis for the assessment of the study's self-created attributes for each company, in terms of business activity, industry classification, and supply-chain links to critical technology areas in the EU and China.

SNI codes provide a hint of the specific type of business activity conducted by Swedish companies in China. However, SNI codes are largely abstract in their descriptions, and an overview of industry distribution based on SNI obscures rather than clarifies in a critical technology context. The study's own model for industry classification, which highlights certain industries of special relevance to the study's context while toning down others, was introduced as an alternative to SNI. This model provides an easy-to-grasp overview of the studied companies and their industry distribution, providing an intermediate step towards assessing company links to critical technology areas.

The last, and perhaps most crucial, of the self-created attributes is supply-chain links to critical technology areas in the EU and China. The reasoning behind this categorisation model is that a binary designation of companies into either having or lacking links to critical technology areas quickly becomes lacking in nuance and insufficient when studying a broad scope of companies within different industries. It is apparent from the results of empirically assessing the categorisation model that much is gained by adding more layers, most notably the category of Supplier. This category captures companies that provide different types of inputs, both in terms of goods and services, with utility for advanced production both within and outside the critical technology areas. Despite the possibly crucial supplier role of such companies, they would risk being ignored in a binary assessment of a company's direct engagement in critical technologies. The category of General Services also provides some additional nuance, by shedding light on industry-agnostic services that help companies both within and outside critical technology areas maintain their operations. However, it should also be noted that the distinction between the different categories can, in certain cases, be hazy, especially due to imperfect information.

Designating the business activity of the studied Swedish companies in China serves to differentiate between companies that engage in production operations in China, and those that only deal in services or sales of goods to the Chinese market. This differentiation is crucial in the context of critical technology areas tied to advanced manufacturing, which in turn is tied to economic security and geo-economic competition for China and the EU. It is also a crucial distinction in the context of vulnerability to technology transfer from foreign companies in China to Chinese industry. The Chinese toolbox for accessing foreign technology is obviously greater if companies have manufacturing, design, and R&D in China, than if they only have sales offices or aftermarket service centres.

There are several difficulties worth highlighting concerning the reliability and validity of the study's method for identifying a company's China-specific business activity. One issue concerns the degree of systematisation of the data collection process. Since the study relies on open-source data, and since the transparency and quality of, for example, annual reports and websites differ between companies, there is an ad hoc nature to the method used here. In some cases, annual reports will provide the most relevant input to the study's self-created attributes, whereas in other cases the main source will be company websites.

Due to the case-by-case nature of data availability and quality, the conditions for providing highly accurate answers to the self-created attributes will also differ between companies. For instance, for corporate groups with multiple companies and brands represented in China, it can sometimes be difficult to determine the distribution of business activities between the different companies. In this report, however, the focus has been on the companies, including their subsidiaries, that are members in the Swedish Chamber of Commerce in China. If it has not been apparent through openly available information that a company has production in China, despite other companies and brands within the same corporate group having local production, the business activity of the studied company has been described as Services or Sales of goods. The study thus potentially underestimates the scope of business activities for the studied companies. On the other hand, the empirical study might also overestimate the extent to which specific products and services are produced or sold in China, due to lack of access to complete data. The assumption here has been that the company's entire product and service portfolio is applicable to China until demonstrated otherwise, with the caveat that export controls may limit certain cross-border flows.

It is also reasonable to assume that companies within the same corporate group collaborate in different ways in their business activities. It is not necessarily sufficient to base estimations of a company's supply-chain links to critical technology areas solely on the business activity that takes place in China. Subsidiaries within a corporate group are seldom isolated from the rest of the corporate structure inside or outside China, which is often apparent as well through open sources, such as company websites and annual reports.[99] In addition to physical flows of goods, personnel and knowledge exchange take place in different ways within corporate groups, which means that global business activities need to be considered. Export controls, or the companies' own decisions regarding information sharing, to some extent limit international flows within corporate groups, not least when it comes to key technologies and dual-use products. At the same time, one of the reasons for the European Commission to consider implementing outbound investment screening is the realisation that existing policy measures may be insufficient to prevent undesired flows of critical technologies.[100]

The methodological approach attempted herein could be further granularised by introducing more layers and nuance to the different models, provided that there is

[99] According to the Team Sweden survey report, an overwhelming majority of Swedish companies in China do not decouple their global operations from China; see Fan et al., *Business Climate Survey*, 26.

[100] European Commission, *Commission Recommendation (EU) 2023/2113*, 2.

sufficient open information for a deeper mapping, and that such a mapping would provide useful answers to justify the additional effort. For instance, business activity could be divided into more categories, and each company's range of business activities in China could be mapped in more detail. Furthermore, more nuance could be introduced to the study's own model for industry classification, for instance, by splitting each of the categories *Business services* and *Other industrial products and machines* into multiple subcategories.

A more granular analysis of supply-chain links to critical technology areas could differentiate between, for example, "Critical Suppliers" and "Peripheral Suppliers." There are both companies with close supply-chain links to Critical Technology Companies, which provide direct inputs to the production of critical technologies, and companies whose supplies to Critical Technology Companies are more indirect, for example, in terms of support systems, infrastructure, and packaging solutions. In addition, some companies could be designated Critical Technology Companies and Suppliers simultaneously, because they both produce critical technologies themselves, while also providing inputs to companies that produce critical technologies. As raised in the discussion above, the ties *between* critical technology areas merit more attention in future mapping processes.

However, there are also methodological constraints with the categorisation of supply-chain links to critical technology areas due to limitations in openly available data. For example, certain Suppliers might be better described as Critical Technology Companies, and vice versa, given more detail on each company's business activities in specific technologies and their customer segments. Prominent examples are companies engaged in smart manufacturing and industrial automation. Moreover, some General Services companies might fit better in the Unrelated category.

This report designates supply-chain links to critical technology areas based on how closely a company's product portfolio is associated with these areas. This association ranges from end production of critical technologies to supplying inputs with diverse applications, or even providing industry-agnostic services. However, an alternative assessment model could put more emphasis on the relative criticality of a company's products for the critical technology areas. For example, if Company A and Company B both supply intermediate inputs to critical technologies, each accounting for a minority share of their revenue, but Company A's product is indispensable while Company B's is easily substitutable, then Company A would be classified as a Critical Technology Company, whereas Company B would be regarded as a Supplier. However, an assessment model for relative criticality would necessitate first conducting detailed supply-chain analyses of individual technologies within the critical technology areas, which would be a daunting task in itself.

In summary, the effort in this report to map the business activity of Swedish companies in China, in combination with the empirical study, serves to provide more insight into the associated methodological difficulties and possibilities. The method presented in this report captures links and potential risks of technology transfer that simpler approaches based on existing industry classification systems may fail to highlight. The method is not without flaws, notably in terms of systematisation and assessment accuracy. There are also alternative methodological choices, for instance in terms of what critical technology areas to focus on, depending on the EU or Chinese strategy document that is used as the starting point; how to define and measure supply-chain links to critical technology areas, and so on.

Moreover, the method is to a large extent generalisable, as long as a list of relevant technology areas is available as starting point. It could therefore be used to map business activity abroad, with focus on home and host countries other than Sweden and China.

The study also presents an initial overview of Swedish companies in China and their supply-chain links to critical technology areas, based on a selected sample of companies. The method and empirical study presented in this report can provide input to and incentivise further research and policy-making processes. Indeed, as the results indicate the strength of a bottom-up methodology in a mapping process, it could be suggested that such a methodology is applied also within the scope of investment screening for outbound investments. However, considering the significance of such investment screening, it would require access to more detailed information than what has been used here to map the links of companies and their businesses activities to critical technology areas.

Hence, the current study holds potential as source of inspiration for governments' efforts in their work related to the scrutiny and screening of inbound and outbound foreign investments. Ultimately, bottom-up processes can enhance the risk assessment and strengthen the governance of foreign investments.

6 Suggestions for future research

This chapter provides suggestions for future research regarding sources and attributes relevant to a broader and deeper mapping and risk analysis, in addition to the recommended methodological improvements noted in Section 5.2. Additional mapping efforts could contribute to furthering knowledge of Swedish overseas business activity, not least in China, and related risks. However, depending on the type of company attributes in question, the data availability will vary between open-source, paid access via commercial databases, and confidential information. Some of the suggestions below that require confidential data can thus be seen as inputs to a potential outbound investment screening mechanism.

6.1 Expanded mapping and additional sources

The empirical study in this report has only covered a subset of all Swedish companies with business in China. Future studies could conduct a more comprehensive mapping, either based on publicly available information or through data accessible via commercial services. If possible, automating parts of the data collection process is advisable, as manual gathering and analysis of open-source information for several hundred companies is exceedingly time-consuming. In that case, the choice of search terms becomes a critical issue. For example, companies may not necessarily use the same terminology for technologies that appear in the EU's and China's lists of critical technology areas. If automated data collection fails to handle such discrepancies, the results may be misleading. The same risk applies to manual data collection.

An expanded mapping would need to go beyond the Swedish Chamber of Commerce in China's membership list. First, the total operations of Swedish corporate groups—including all companies and brands in China represented at the Swedish Chamber of Commerce in China—could be mapped through a snowball effect, based on information about the corporate groups from other open sources. An expanded mapping could also be based on a synthesis of multiple company lists. For example, companies that are members of the Sweden-China Trade Council but not the Swedish Chamber of Commerce in China could be included.[101] The same applies to member companies of the Swedish Chamber of Commerce in Hong Kong, and the European Chamber of Commerce in China.[102] Furthermore, it would be possible to include companies listed on the Stockholm Stock Exchange

[101] "Our Valued Members," Sweden–China Trade Council, https://sctc.se/our-valued-members/.
[102] "All Members," Swedish Chamber of Commerce in Hong Kong, https://www.swedcham.com.hk/all-members; "Member Directory," European Chamber of Commerce in China, https://www.europeanchamber.com.cn/en/business-directory/list?f%5Bcountry%5D%5B75%5D%3D1.

that are not members of the Chambers of Commerce or the Sweden-China Trade Council. Of course, there are also non-listed companies with operations in China, but a structured mapping of such companies would likely be very time-consuming.

For an expanded mapping, additional data sources beyond those consulted in this study could be utilised. There are Swedish government authorities, primarily Statistics Sweden (*Statistikmyndigheten SCB*) and the Agency for Growth Policy Analysis, tasked with collecting and compiling data on Swedish investments abroad. However, as mentioned earlier, confidentiality restrictions prevent them from sharing granular company-level data. Moreover, the microdata collected by Statistics Sweden is not necessarily in a format directly applicable to the context of critical technologies. Besides statistical authorities, organisations such as Business Sweden publish some open reports related to Swedish investments in China, but these do not include company lists or comprehensive data on individual companies.

There are also subscription-based commercial databases covering international corporate investments, including Swedish companies in China.[103] The quantity and type of data available vary between providers. Furthermore, these databases may have issues regarding data traceability, such as source referencing and timestamps. This can be due either to a lack of such information or to commercial confidentiality. Regardless, these factors can make some services difficult or unsuitable to use for research purposes.

Lastly, Swedish business activity in host countries other than China could be mapped using the method presented in this report. Such studies could enable the purpose of performing cross-country comparisons of supply-chain links to critical technology areas for Swedish business abroad. Analogously, other home countries could be used as a starting point. Needless to say, relevant sources and their accessibility will differ depending on the country in question.

6.2 Further attributes of interest

There are many possible attributes that could be relevant for mapping Swedish companies and their business activities in China. In the context of critical technologies and technology transfer risks, however, some are more important than others. The examples below point to attributes worth considering in future research, though doing so would require access to data beyond the data used in this report's empirical study. This also includes data from commercial databases that are not open-source and would require paid subscriptions.

[103] Examples include Orbis, Sayari, Datenna, Altana, and WireScreen.

One of the most important attributes to consider in future research is the mode of entry, differentiating between, at least, acquisitions, mergers, greenfield investments, and joint ventures. The 2024 European Commission white paper on outbound foreign direct investment also recommends mapping transfers of assets and venture capital.[104] Mode of entry is an important factor in the context of critical technology areas and technology transfer risks, as it affects, for example, the degree of managerial control over Swedish business operations, the handling of proprietary technology in China, and the underlying investment motivations. Another attribute, ownership shares (including voting and decision-making rights), is relevant in this context as well, and should be considered in future research.

The issue of joint ventures is especially noteworthy. Given access to more detailed data, it would be of interest to determine what proportion of investments in China are joint ventures with Chinese minority or majority owners, as well as the nature of these partner companies' other activities. Furthermore, it would be valuable to map and analyse patterns in how the prevalence of joint ventures varies across different industries, and to examine the ownership structures of the Chinese partners, especially with regard to direct state ownership. In relation to this, it would also be relevant to study the significance of personal ties—for example, Chinese co-owners represented on company boards and their involvement in other companies and industries with varying degrees of state affiliation, as well as their proximity to critical industries and/or the defence sector.

Another data point of interest is the geographic distribution of Swedish investments in China. This is relevant as the industrial policy efforts of the Chinese state include designated cities and city clusters for the development of specific industries and technologies.[105] There is an abundance of industrial parks in China that concentrate Chinese companies within similar industries or technology areas. This is attractive also to foreign companies seeking new opportunities for sales and innovation, while also bringing them closer to Chinese state actors with exploitative intentions.[106]

A basic assumption is that foreign companies are heavily concentrated in the coastal provinces of eastern and southeastern China, as well as in the capital region. Although a systematic mapping of geographical distribution has not been made in the empirical study here, it appears that Swedish company subsidiaries are frequently located in Beijing, but also in Tianjin, Shenzhen, Shanghai, and surrounding areas. This picture is confirmed by the Team Sweden survey results, which identify the eastern and southeastern coastal provinces as the most popular locations for Swedish companies, alongside the capital area, but also Sichuan and

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[104] European Commission, *White Paper*, 6.

[105] Max J. Zenglein, and Anna Holzmann, *Evolving Made in China 2025: China's industrial policy in the quest for global tech leadership* (MERICS, July 2019), 39, https://merics.org/en/report/evolving-made-china-2025.

[106] Junerfält, *China's Technology Transfer Ecosystem*, 26.

Hubei.[107] A more comprehensive mapping could include geographical distribution as a factor and provide a clearer picture of the allocation of Swedish investments across western, southern, northern, and eastern China, as well as at the provincial level and with regard to specific industrial cities and industrial parks of particular importance to certain industries in China.

Additional attributes to examine include patents related to Swedish companies' operations in China, which can more clearly demonstrate the connection between their activities and critical industries, as well as the extent to which these companies are technology leaders in their fields. The European Commission's 2024 white paper and 2025 recommendation propose further attributes to consider, such as past or future investments related to the companies and individuals studied, contracts concerning R&D, licensing of intellectual property rights, and key personnel transfers associated with investments.[108]

The mapping conducted in this study has primarily focused on the connection between Swedish companies operating in China and the critical technology areas identified by the EU and China, approached from a supply-chain perspective. Quantitative data related to the operations of these companies in China have not been included in the results. Examples of such data include turnover, employee numbers, investment values, and public financial support from the EU or its member states in relation to specific technology areas. Swedish government agencies such as the Agency for Growth Policy Analysis, Statistics Sweden, and the National Board of Trade publish aggregate data on some of these attributes, particularly turnover, employment figures, and investment values (see Chapter 1), but not at the individual company level.

Turnover and employee numbers were initially considered for inclusion in this study but were later excluded, partly due to limited data availability, and partly because they were assessed to be of limited relevance in the specific context of critical technology areas. Nonetheless, these indicators could serve as valuable components in a broader mapping and risk analysis framework. It is worth noting that some data on turnover and employee numbers related to China are available through publicly accessible annual reports. However, such data tends to be characterised by patchy availability and lack of comparability. Some companies report figures at the national level, others at the regional level (e.g., "Asia" or "Asia-Pacific"), while others only disclose them at the corporate group level, or not at all.

Regarding employee numbers specifically, it is rarely possible to distinguish between Swedish and locally employed staff, or to break down personnel by function (e.g., manufacturing versus sales). However, the aforementioned Team Sweden

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[107] Fan et al., *Business Climate Survey*, 41.
[108] European Commission, *White Paper*, 8–9; European Commission, *Commission Recommendations*, 5.

survey's results indicate that local employees make up the vast majority of the workforce at Swedish companies operating in China.[109]

6.3 Deeper and diversified risk analysis

Risk analysis has not been a central part of this study, except for the overarching discussion on technology transfer presented in the contextual framework in Chapter 2. To some extent, it is inherent in the nature of a mapping focused on critical technology areas, considered significant in both the EU and China not only for economic but also for national security reasons, that the study adopts a risk perspective. However, detailed discussion and conclusions regarding individual companies, as well as broader considerations of risks beyond technology transfer, fall outside the scope of this study.

Future studies, ideally based on case studies of specific companies and technologies, could explore risks related to both legal and illegal technology transfer, as well as other types of risks such as economic exposure. Such risk analyses could examine differences in risk profiles associated with operations in China for large versus small companies; companies operating within versus outside critical technology areas; companies leading versus lagging the Chinese industry within their technology sectors; companies with or without partial Chinese ownership; and companies with or without Chinese Communist Party cells. R&D partnerships with Chinese universities would also be a suitable subject for risk analysis. Risk analyses can be conducted at the corporate group or individual company level, depending on the type of risk being examined. The same applies to risks related to Swedish investment firms and their varying degrees of ownership stakes and exposure to Swedish companies operating in China across different industries. The availability of data for different types of risk analyses will naturally vary.

The potential contribution, albeit likely of an indirect nature, of Swedish business activity in China to the Chinese defence industry is another pertinent topic. The question has been raised in this report, but there has been no in-depth exploration of the empirical reality. Even though data on supplies from Swedish companies in China that end up with the Chinese defence industry are probably hard to come by, this is a suitable topic for future studies. On a related note, the significance of Swedish business activity in China for the Swedish defence industry is itself an interesting topic. Are there important subcomponents or other inputs to the Swedish defence industry that rely on Swedish business activity in China? If so, what are the associated risks?

Regarding economic exposure specifically, it is an interesting but challenging attribute to capture in risk analyses. It can be an oversimplification, for example, to base assessments solely on the share of a company's turnover reported for the

[109] Fan et al., *Business Climate Survey*, 6.

Chinese market compared with the company's or corporate group's total turnover. Subsidiaries in China may sell to third countries, and such sales could be reported under separate categories. Furthermore, turnover related to China should ideally be considered in relation to the costs associated with business activities in China. However, this type of detailed data is not publicly available for all companies.

China can also have a broader significance for a company's economic health than turnover figures alone reveal. For instance, customers or business partners in third countries may have significant exports to China, creating an indirect dependence for the company in question. Moreover, business activities based in China often extend to other markets in China's vicinity and globally.[110]

[110] Portén et al, *Navigating Uncertainty*, 4.

7 References

Alfa Laval. *Annual & Sustainability Report 2024*. 1 April 2025. https://www.alfalaval.com/investors/publications/annual-reports/.

Alfa Laval. "Find your contact." Accessed 30 June 2025. https://www.alfalaval.com/contact-us/?countryId=814&officeTypeId=0&zipcode=null&isFilter=true&toScroll=false.

Alfa Laval. "Industries." Accessed 30 June 2025. https://www.alfalaval.com/.

Almén, Oscar and Christopher Weidacher Hsiung. *China's Economic Influence in the Arctic Region: The Nordic and Russian cases*. FOI-R--5326--SE. Swedish Defence Research Agency (FOI), 2022. https://www.foi.se/en/foi/reports/report-summary.html?reportNo=FOI-R--5326--SE.

Almén, Oscar. *Kinesiska investeringar i Sverige: en kartläggning*. FOI-R--5474--SE. Swedish Defence Research Agency (FOI), 2023. https://www.foi.se/rapportsammanfattning?reportNo=FOI-R--5474--SE.

Almén, Oscar and Hanna Carlsson. *The Chinese Communist Party's influence over businesses*. FOI-R--5695—SE. Swedish Defence Research Agency (FOI) and the Swedish National China Centre, 2025. https://www.foi.se/rapporter/rapportsammanfattning.html?reportNo=FOI-R--5695--SE.

Angliviel de la Beumelle, Marcel, Ben Spevack, and Devin Throne. *Open arms: Evaluating global exposure to China's defense-industrial base*. C4ADS, 2019. https://c4ads.org/wp-content/uploads/2019/10/OpenArms-Report.pdf.

Assa Abloy. *Annual Report 2024*. 19 March 2025. https://www.assaabloy.com/group/en/documents/investors/annual-reports/2024/Annual%20Report%202024.pdf.

AstraZeneca. *What science can do: AstraZeneca Annual Report and Form 20-F Information 2024.* 6 February 2025. https://www.astrazeneca.com/investor-relations/annual-reports/annual-report-2024.html;

AstraZeneca. "Our Company." Accessed 26 June 2025. https://www.astrazeneca.com/our-company.html.

Atlas Copco. *Annual Report 2024*. 20 March 2025. https://www.atlascopcogroup.com/en/investors/reports-and-presentations.

Avanza. "OMX Stockholm 30." Accessed 26 June 2025. https://www.avanza.se/index/om-indexet.html/19002/omx-stockholm-30.

Baidu Baike. 百度百科. https://baike.baidu.com/.

Björk, Aron. *Utgående direktinvesteringar och ekonomisk säkerhet*. FOI Memo 8804. Swedish Defence Research Agency (FOI), 2025. https://www.foi.se/rest-api/report/FOI%20Memo%208804.

Bloomberg. "Xi Mulls New Made-In-China Plan Despite US Calls to Rebalance." 25 May 2025. https://www.bloomberg.com/news/articles/2025-05-26/xi-plans-new-made-in-china-effort-even-as-trump-aims-to-boost-us-manufacturing.

Cappelin, Björn. *Kinas industripolitik: nulägesbild, riktningen framöver och konsekvenser för Sverige*. Nationellt kunskapscentrum om Kina, 2022. https://kinacentrum.se/publikationer/kinasindustripolitik-nulagesbild-riktningen-framover-och-konsekvenser-for-sverige/.

Ciabuschi, Francesco. "On IT Systems and Knowledge Sharing in MNCs: A Lesson from Siemens AG" *Knowledge Management Research & Practice* 3 (2005): 87-96, https://doi.org/10.1057/palgrave.kmrp.8500057.

Chan, Kyle. "China's overlapping tech-industrial ecosystems." *High Capacity* (blog). 22 January 2025. https://www.high-capacity.com/p/chinas-overlapping-tech-industrial.

Cheung, Tai Ming. *Innovate to Dominate: The Rise of the Chinese Techno-Security State*. Ithaca; London: Cornell University Press, 2022.

Chung, Wilbur. “Identifying Technology Transfer in Foreign Direct Investment: Influence of Industry Conditions and Investing Firm Motives.” *Journal of International Business Studies* 32 (June 2001): 211–29. https://link.springer.com/article/10.1057/palgrave.jibs.8490949.

Electrolux Group. *Annual Report 2024*. 20 February 2025. https://www.electroluxgroup.com/en/ab-electrolux-publishes-2024-annual-report-43521/.

European Chamber of Commerce in China. “Member Directory.” https://www.europeanchamber.com.cn/en/business-directory/list?f%5Bcountry%5D%5B75%5D%3D1.

European Commission. *Commission Recommendation (EU) 2025/63 of 15 January 2025 on reviewing outbound investments in technology areas critical for the economic security of the Union*. European Commission, 2025. https://eur-lex.europa.eu/eli/reco/2025/63/oj/eng.

European Commission. *Commission Recommendation (EU) 2023/2113 of 3 October 2023 on critical technology areas for the EU’s economic security for further risk assessment with Member States.* European Commission, 2023. https://eur-lex.europa.eu/legal-content/SV/TXT/?uri=CELEX:32023H2113.

European Commission. “Commission restricts Chinese participation in medical devices procurement.” 20 June 2025. https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1569.

European Commission. “EU Commission imposes countervailing duties on imports of battery electric vehicles (BEVs) from China.” 12 December 2024. https://trade.ec.europa.eu/access-to-markets/en/news/eu-commission-imposes-countervailing-duties-imports-battery-electric-vehicles-bevs-china

European Commission. *White Paper on Outbound Investments COM(2024) 24 final*. European Commission, 2024. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52024DC0024.

European Commission. “Speech by President von der Leyen on EU-China relations to the Mercator Institute for China Studies and the European Policy Centre.” 30 March 2023. https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2063.

European External Action Service. “EU-China Relations factsheet.” 7 December 2023. https://www.eeas.europa.eu/eeas/eu-china-relations-factsheet_en.

Fan, Luting, Per Portén, Johan Ming Chou Chen, Malin Hammarén, Erik Lindner Olsson, Lennart Nilsson, and David Jallow. *Business Climate Survey for Swedish Companies in Mainland China 2025: A Report from Team Sweden in Mainland China*. Business Sweden in China, Swedish Chamber of Commerce in China, Embassy of Sweden in China, Consulate General of Sweden in Shanghai China, 2025. https://www.swedcham.cn/sites/default/files/2025-05/2025%20BCS_Final%200528%281%29.pdf.

de Faria, Pedro, and Wolfgang Sofka. “Knowledge Protection Strategies of Multinational Firms: A Cross-Country Comparison.” Research Policy 39:7 (2010): 956–68. https://doi.org/10.1016/j.respol.2010.03.005.

Ferreira, João J., Cristina I. Fernandes, Ying Guo, and Hussain G. Rammal. “Knowledge Worker Mobility and Knowledge Management in MNEs: A Bibliometric Analysis and Research Agenda.” *Journal of Business Research* 142 (2022): 464–75, https://www.sciencedirect.com/science/article/pii/S014829632100970X.

Freifeld, Karen. ”Exclusive: TSMC could face $1 billion or more fine from US probe, sources say.” *Reuters*. 9 April 2025. https://www.reuters.com/technology/tsmc-could-face-1-billion-or-more-fine-us-probe-sources-say-2025-04-08/.

Government of Sweden. “Sanctions against China.” Accessed 30 June 2025. https://www.government.se/government-policy/foreign-and-security-policy/international-sanctions/geographical-sanctions/china---sanctions/.

Groenewegen-Lau, Jeroen, and Jacob Gunter. *The trade-offs of innovating in China in times of global technology rivalry*. MERICS, 2025. https://merics.org/en/report/trade-offs-innovating-china-times-global-technology-rivalry.

Hexagon. 关于海克斯康 [“About Hexagon.”] Accessed 1 July 2025. https://www.hexagonmi.com.cn/introduction.

Hexagon. *2024 Annual and Sustainability Report*. 27 March 2025. https://vp208.alertir.com/afw/files/press/hexagon/202503255363-1.pdf.

H&M. *H&M Group Annual & Sustainability Report 2024.* 20 March 2025. https://hmgroup.com/wp-content/uploads/2025/03/HM-Group-Annual-and-sustainability-report-2024.pdf

H&M. “Supply chain.” Accessed 1 July 2025. https://hmgroup.com/sustainability/leading-the-change/transparency/supply-chain/.

Junerfält, Tobias. *China’s Technology Transfer Ecosystem—Key Actors and the Case of China Electronics Technology Group Corporation*. FOI-R--5641--SE. Swedish Defence Research Agency (FOI), 2024. https://www.foi.se/en/foi/reports/report-summary.html?reportNo=FOI-R--5641--SE.

Junerfält, Tobias and Emil Wannheden. *Manufacturing Vulnerabilities: Chinese Minerals, Semiconductors and Green Technologies in the EU*. FOI-R--5524--SE. Swedish Defence Research Agency (FOI), 2024. https://www.foi.se/rest-api/report/FOI-R--5524--SE.

Kao, Jeanny. “TSMC needs government permission for overseas joint ventures, Taiwan minister says.” *Reuters*. 27 February 2025. https://www.reuters.com/technology/tsmc-needs-government-permission-overseas-joint-ventures-taiwan-minister-says-2025-02-27/?utm_source=chatgpt.com.

Kratz, Agatha, Max J. Zenglein, Andreas Mischer, Gregor Sebastian, and Armand Meyer. *Chinese investment rebounds despite growing frictions—Chinese FDI in Europe: 2024 Update.* Rhodium Group and MERICS, 2025. https://merics.org/en/report/chinese-investment-rebounds-despite-growing-frictions-chinese-fdi-europe-2024-update.

Lampinen, Frida and Anders Schröder. *Innovation Capacity in the People’s Republic of China: On the state of the innovation assessment literature and strategic ambitions in science and technology governance*. FOI-R-5771—SE. Swedish Defence Research Agency (FOI), 2025. https://foi.se/rapporter/rapportsammanfattning.html?reportNo=FOI-R--5771--SE.

National Development and Reform Commission of China. 关于征求对《鼓励外商投资产业目录》（公开征求意见稿）意见的公告 [“Announcement on Soliciting Opinions on the Catalogue of Industries Encouraged for Foreign Investment (Draft for Public Comment).”] 20 December 2024. Accessed 27 June 2025. https://yyglxxbsgw.ndrc.gov.cn/htmls/article/article.html?articleId=2c97d16b-93251263-0193-de120be6-000f#iframeHeight=810.

Olcott, Eleanor, Zijing Wu, and Chris Cook. “Satellite images reveal Huawei’s advanced chip production line in China.” *Financial Times.* 4 May 2025. https://www.ft.com/content/afd618f8-12c9-4297-b2a9-49f7dc548da4.

Portén, Per, Johan Thurée, and Frida Haapaniemi. *Navigating Uncertainty: Building resilience and agility into your China strategy*. Business Sweden, 2022. https://www.business-sweden.com/4abfa5/globalassets/insights/reports/navigating-uncertainty.pdf.

Reuters. “China retaliates against EU ban with import restrictions on medical devices.” 7 July 2025. https://www.reuters.com/business/healthcare-pharmaceuticals/china-restricts-eu-imports-medical-devices-2025-07-06/.

SEB. *Annual Report 2024*. 11 March 2025. https://sebgroup.com/annualreport.

Sebastian, Gregor, and François Chimits. “‘Made in China’ electric vehicles could turn Sino-EU trade on its head.” MERICS. 30 May 2022. https://merics.org/en/comment/made-china-electric-vehicles-could-turn-sino-eu-tradeits-head.

State Council of China. 中国制造 2025 [“Made in China 2025.”] 19 May 2015. https://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm.

Subramaniam, Mohan. “Integrating Cross-Border Knowledge for Transnational New Product Development.” *The Journal of Product Innovation Management* 23 (2006): 541–55, https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5885.2006.00223.x.

Swedish Agency for Growth Policy Analysis. *Statistik 2024:05 Svenska koncerner med dotterbolag i utlandet 2022*. 26 September 2024, https://www.tillvaxtanalys.se/download/18.2d9222ef1921c8305804d85f/1727366274574/Statistik_2024_05%20Svenska%20koncerner%20med%20dotterbolag%20i%20utlandet%202022_2.pdf.

Swedish Agency for Growth Policy Analysis. *Statistik 2023:06 Forskning och utveckling i internationella företag 2021*. 28 September 2023. https://www.tillvaxtanalys.se/download/18.eb7fc8818ad6889aac233e/1695880212505/Statistik%202023_06%20FoU%20i%20internationella%20f%C3%B6retag%202021.pdf.

Swedish Chamber of Commerce in China. “Corporate Members.” https://www.swedcham.cn/membership-directory/corporate.

Sweden-China Trade Council. “Our Valued Members.” https://sctc.se/our-valued-members/. https://sctc.se/

Sweden Herald. “Electrolux and Kinnevik Removed from Stockholm's OMXS30 Index.” 23 June 2025. https://swedenherald.com/article/electrolux-and-kinnevik-removed-from-stockholms-omxs30-index.

Swedish Chamber of Commerce in Hong Kong. “All Members.” https://www.swedcham.com.hk/all-members.

Swedish Inspectorate of Strategic Products. “Tekniskt bistånd.” Accessed 20 October 2025. https://isp.se/produkter-med-dubbla-anvandningsomraden/kontroll-av-ej-listad-pda/tekniskt-bistand.

Swedish National Board of Trade. “Direktinvesteringar—tillgångar och flöden.” Accessed 16 May 2025. https://www.kommerskollegium.se/utrikeshandel-och-statistik/handelsstatistik/direktinvesteringar/.

Swedish National Board of Trade. “Sveriges export till Kina.” Accessed 16 May 2025. https://www.kommerskollegium.se/utrikeshandel-och-statistik/handelsstatistik/varuhandel/hitta-handelsstatistik-for-ett-land-eller-region.

TSMC. *Annual Report 2024*. 12 March 2025. https://investor.tsmc.com/sites/ir/annual-report/2024/2024%20Annual%20Report_E.pdf.

U.S. Chamber of Commerce Foundation, “New Report Finds American Businesses Significantly Increasing Focus on Geopolitical Risk,” 22 April 2025. https://www.uschamberfoundation.org/emerging-issues/new-report-finds-american-businesses-significantly-increasing-focus-on-geopolitical-risk

Varas, Antonio, Raj Varadarajan, Jimmy Goodrich, and Falan Yinug. *Strengthening the Global Semiconductor Supply Chain in an Uncertain Era*. Boston Consulting Group and Semiconductor Industry Association, 2021. https://www.semiconductors.org/wp-content/uploads/2021/05/BCG-x-SIA-Strengthening-the-Global-Semiconductor-Value-Chain-April-2021_1.pdf.

Zenglein, Max J., and Anna Holzmann. *Evolving Made in China 2025: China's industrial policy in the quest for global tech leadership*. MERICS, July 2019. https://merics.org/en/report/evolving-made-china-2025.

Zhou, Qian. “China Released Draft Encouraged Catalogue to Boost Foreign Investment.” 24 December 2024. https://www.china-briefing.com/news/china-2022-encouraged-catalogue-updated-implementation-from-january-1-2023/.

Appendix A: Industry distribution according to SNI

Table 18, below, breaks down the industry distribution of the studied companies according to SNI.

Table 18. 2-digit SNI for the studied companies.

SNI code	Number of companies (share of total)
46 Wholesale trade, except of motor vehicles and motorcycles	34 (20.4%)
28 Manufacture of machinery and equipment n.e.c.	17 (10.2%)
70 Activities of head offices; management consultancy activities	12 (7.2%)
26 Manufacture of computers, electronic and optical products	10 (6.0%)
71 Architectural and engineering activities; technical testing and analysis	10 (6.0%)
25 Manufacture of fabricated metal products, except machinery and equipment	7 (4.2%)
62 Computer programming, consultancy and related activities	7 (4.2%)
27 Manufacture of electrical equipment	6 (3.6%)
22 Manufacture of rubber and plastic products	5 (3.0%)
24 Manufacture of basic metals	5 (3.0%)
29 Manufacture of motor vehicles, trailers and semi-trailers	5 (3.0%)
47 Retail trade, except of motor vehicles and motorcycles	5 (3.0%)
52 Warehousing and support activities for transportation	5 (3.0%)
30 Manufacture of other transport equipment	3 (1.8%)
31 Manufacture of furniture	3 (1.8%)
64 Financial service activities, except insurance and pension funding	3 (1.8%)
20 Manufacture of chemicals and chemical products	2 (1.2%)
32 Other manufacturing	2 (1.2%)
45 Wholesale and retail trade and repair of motor vehicles and motorcycles	2 (1.2%)
58 Publishing activities	2 (1.2%)
72 Scientific research and development	2 (1.2%)
74 Other professional, scientific and technical activities	2 (1.2%)
85 Education	2 (1.2%)
10 Manufacture of food products	1 (0.6%)
11 Manufacture of beverages	1 (0.6%)

Table 18. continued.

16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	1 (0.6%)
17 Manufacture of paper and paper products	1 (0.6%)
21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	1 (0.6%)
50 Water transport	1 (0.6%)
51 Air transport	1 (0.6%)
61 Telecommunications	1 (0.6%)
68 Real estate activities	1 (0.6%)
73 Advertising and market research	1 (0.6%)
78 Employment activities	1 (0.6%)
79 Travel agency, tour operator and other reservation service and related activities	1 (0.6%)
80 Security and investigation activities	1 (0.6%)
82 Office administrative, office support and other business support activities	1 (0.6%)
86 Human health activities	1 (0.6%)
96 Other personal service activities	1 (0.6%)
Sum of companies	**167**

A company can be assigned multiple SNI codes if it has several business activities, but our aim here has been to identify one SNI code that best represents the firm's main activity in China. Using SNI, the business activities of the companies studied can be grouped into manufacturing and the service sector. SNI 10-33 correspond to manufacturing industry, and SNI 45-96 cover the service sector (including trade).[111] As shown in Table 18, the distribution between the manufacturing industry and the service sector among the studied companies is 41.9 per cent and 58.1 per cent, respectively, underscoring the importance of the service sector and the fact that a slight majority are primarily engaged in services and trade.

However, Table 18 says little about the companies' links to critical technology areas. 2-digit SNI codes are too abstract; the most common SNI code in this mapping—*46 Wholesale trade, except of motor vehicles and motorcycles*—is extremely broad, essentially covering all non-automotive trade with no further differentiation. Likewise, some seemingly more specific 2-digit SNI codes, such as *26 Manufacture of computers, electronic and optical products*, bundle together relevant items (e.g., semiconductors) with less relevant ones (e.g., computer mice) from a critical technology perspective.

Even using 5-digit SNI codes, as provided by Allabolag, analytical applicability varies widely. *46.761 Wholesale of industry supplies* is more detailed than its

[111] Swedish Agency for Growth Policy Analysis, *Statistik 2024:05*, 23.

corresponding 2-digit SNI code, but still insufficient to estimate the degree of linkage to critical technology areas. In some cases, 5-digit SNI codes are quite specific, such as *26.120 Manufacture of loaded electronic boards*, whereas others remain too abstract, for instance *26.110 Manufacture of electronic components*.

In sum, even with 5-digit SNI codes it remains difficult to map the studied companies' business activities onto the EU's and China's critical technology areas.

Appendix B: List of studied Swedish companies in China

Table 19. Companies with a Swedish group parent company.

Swedish Chamber of Commerce in China member company	Group parent company
Absolent (Beijing) Co., Ltd.	Mexab Holding AB
Absortech Desiccant (Shanghai) Co., Ltd.	Pamica 2 AB
Acne Studios	Acne Studios Holding AB
AFRY Engineering (Shanghai) Co., Ltd	AFRY AB
Aleido	Ratos AB
Alfa Laval	Alfa Laval AB
Alleima (Shanghai) Material Technology Co., Ltd.	Alleima AB
AQG	AQ Group AB
ASSA Abloy	ASSA ABLOY AB
Atlas Copco	Atlas Copco Aktiebolag
Babybjörn	Lillemor Design AB
Beijer electronics trading (Shanghai) Co., Ltd	Ependion AB
Bergman & Beving (Shanghai) Co., Ltd	Bergman & Beving Aktiebolag
Boxon (Shanghai) Packaging Co. Ltd	Alpy AB
Brandon Trading (Shanghai) Ltd.	Brandon Holding AB
Brokk (Beijing) Machines Co., Ltd	Carl Bennet AB
Bufab Fasteners Trading (Shanghai) Co., Ltd.	Bufab AB (publ)
Bulten Fasteners (China) Co., Ltd.	Bulten AB
Business Sweden	Sveriges export- och investeringsråd
Cabinair Tech (Shenzhen) Co., Ltd.	Cabinair Sweden Holding AB
Camfil Filtration (Shanghai) Co., Ltd.	Camfil Ventures Aktiebolag
CBG (Shanghai) Co., Ltd.	CBG Konsult & Information AB
CEJN (Shanghai) Fluid Systems Co., Ltd.	Cejn Aktiebolag
Celemi Consulting (Shanghai) Co., Ltd.	Celemi Holding AB
Clas Ohlson (Shanghai) Co., Ltd.	Clas Ohlson Aktiebolag
Create365 AB	Create365 AB
Daniel Wellington	JFT Holding AB
DIAB (Kunshan) Co., Ltd.	Ratos AB
Dustie Technology Sweden AB	Dustie Technology Sweden AB
Edsbyn SENAB Group	Edsbyn Senab AB (publ)
Electrolux (China) Home Appliance Co., Ltd.	Aktiebolaget Electrolux
Elekta (China) Investment Ltd. Co.,	Elekta AB (publ)
Eletta Group	Eletta Invest AB
ELME Spreader Trading (Shanghai) Co., Ltd.	Elme Spreader AB
Elof Hansson AB Shanghai Rep. Office	ELOF HANSSONS STIFTELSE
Elpress (Beijing) Electrical Components Co., Ltd.	Lagercrantz Group Aktiebolag
Enact (Shanghai) Management Consulting Co., Ltd	Enact Sustainable Strategies Group ESS AB
Envac Environmental Technology (Shanghai) Co., Ltd.	Stena Aktiebolag
Epiroc	Epiroc Aktiebolag
Ericsson (China) Communications Co, Ltd.	Telefonaktiebolaget L M Ericsson
Fagerhult Lighting System (Suzhou) Co., Ltd. Shanghai Branch Office	Fagerhult Group AB

Table 19. continued.

Swedish Chamber of Commerce in China member company	Group parent company
FKAB Marine Design (Shanghai) Co., Ltd.	Mattssonföretagen i Uddevalla Aktiebolag
Fotografiska China Limited	Fotografiska Group Gmbh
Fredriksons Industry (Suzhou) Co., Ltd.	XANO Industri AB
Gränges Aluminium (Shanghai) Co., Ltd	Gränges AB
Gunnebo Security (China) Co., Ltd.	Altor V GB Holding AB
H&M Hennes & Mauritz (Shanghai) Trading Co. Ltd	Ramsbury Invest AB
HANZA Electric (Suzhou) Co.,LTD	HANZA AB
Hexagon Manufacturing Intelligence (Qingdao) Co., Ltd.	Hexagon Aktiebolag
HMS	HMS Networks AB
Hoganas (China) Co., Ltd	Höganäs Holding AB
Husqvarna (Shanghai) Management Co. Ltd.	Husqvarna AB
IAR System Development (Shanghai) Co., Ltd.	I.A.R. Systems Group AB
ICA Global Sourcing	ICA Gruppen Aktiebolag
Impact Coatings (China) Co., Ltd.	Impact Coatings AB (publ)
ITAB Shop Concept China Co Ltd	ITAB Shop Concept AB
IVL Swedish Environmental Research Institute	STIFT INSTITUTET F VATTEN- O LUFTVÅRDSFORSKNING
Jula	KJB Holding AB
Kappahl Far East Shanghai Rep. Office	Mellby Gård Holding AB
K-FAB Scandinavia	Teqnion AB
Klattermusen (Beijing) Outdoors Product Co., Ltd.	Klättermusen Aktiebolag
Kreab	Auronus AB
Kuiperbelt Mobility AB	Kuiperbelt Mobility AB
Kunshan Välinge Building Materials Technology Co., Ltd.	Pervan Holding AB
Kvaser	Seven District AB
LeanDev China	Vilja Solutions AB
Lesjöfors China Ltd.	Beijer Alma AB
Liljas Plastic Suzhou Co., Ltd	Liljas Plast Aktiebolag
LKAB Trading (Shanghai) Co., Ltd	Regeringskansliet
Lotus Travel AB / Scandinavian Perspectives AB	Lotus Travel Group AB
Lyckeby Culinar Shanghai Co., Ltd.	Sveriges Stärkelseproducenter, förening u.p.a.
MAQUET (Shanghai) Medical Equipment Co., Ltd. [Getinge]	Carl Bennet AB
Meson (Changzhou) Flow Control System Co., Ltd.	Indutrade Aktiebolag
Molnlycke Health Care (Shanghai) Co., Ltd.	Investor Aktiebolag
Monitor ERP System (Shanghai) Co Ltd	Monitor ERP Group AB
MQ Shanghai Co., Ltd.	MQ MarQet AB
MU	STIFTELSEN MERCURI URVAL
Munters Air Treatment Equipment Beijing Co., Ltd	Munters Group AB
Nederman International Trading (Shanghai) Co., Ltd.	Nederman Holding Aktiebolag
NEFAB Packaging Engineering (Wuxi) Co., Ltd.	Nefab Holding AB
Nilorn Shanghai Company Limited	AB Traction

Table 19. continued.

Swedish Chamber of Commerce in China member company	Group parent company
Nolato Mobile Communication Polymers (Beijing) Co., Ltd.	Nolato Aktiebolag
Nordic Sustainable Development Association	Ideella föreningen Nordic Sustainable Development Association
Nord-Lock (Shanghai) Co. Ltd	Investmentaktiebolaget Latour
NOTE ELECTRONICS (Dong Guan) LTD	NOTE AB (publ)
OATLY	Oatly Group AB (publ)
OEM Automatic (Shanghai) Co., Ltd.	OEM International Aktiebolag
PAX	Volution Ventilation Group Ltd
Permobil (KunShan) Co., Ltd.	Investor Aktiebolag
Piab	Investor Aktiebolag
PipeChain Networks AB	Illerim AB
Port of Gothenburg—Göteborgs Hamn	GÖTEBORGS KOMMUN
Prorector AB	Billsta Invest AB
QuizRR AB	QuizzRR AB
Roxtec Sealing System (Shanghai) Co., Ltd.	Mellby Gård Holding AB
Sandvik (China) Holding Co., Ltd.	Sandvik Aktiebolag
Scandinavian Airlines System	SAS AB
SEB Shanghai Branch	Skandinaviska Enskilda Banken AB
Securitas China/ Pinkerton Security Management Services	Securitas AB
SHL-Healthcare	Spinnaker Ventures Establishment
Sigma Kudos (Beijing) Co., Ltd.	Danir Development AB
SKF	Aktiebolaget SKF
SSAB Swedish Steel	SSAB AB
Stegia Shanghai Co., Ltd.	Stegia Aktiebolag
Stena RoRo Asia	Stena Aktiebolag
Stiga Sports Beijing Co., Ltd.	STIGA Sports Holding AB
SWA Development AB	SWA Development AB
Sweco International	SWECO AB (publ)
Swedbank Shanghai Branch	Swedbank AB
Syntronic (Beijing) Technology R&D Centre Co., Ltd.	Syntronic Holding AB
Tobii Dynavox (Suzhou) Co. Ltd.	Dynavox Group AB
Trelleborg	Henry Dunkers Donationsfond & Stiftelser
Troax (Shanghai) safety system Co., Ltd.	Troax Group AB (publ)
Ufab	Mattssonföretagen i Uddevalla Aktiebolag
UVA LIDKOPING Precision Grinding Technology(Beijing)Co., Ltd.	Nordstjernan Aktiebolag
VisitSweden	Regeringskansliet
Volumental Asia Limited	Volumental AB
Volvo (China) Investment Co., Ltd.	Aktiebolaget Volvo

Sources: Swedish Chamber of Commerce in China, Allabolag

Table 20. Companies with a foreign group parent company.

Swedish Chamber of Commerce in China member company	**Associated company in Sweden**	**Group parent company (country of incorporation)**
ABB (China) Ltd.	ABB AB	ABB Ltd. (Switzerland)
Alvarez & Marsal Consulting (Shanghai) Limited	Alvarez & Marsal Sweden AB	Alvarez & Marsal (USA)
ANP	Alstom Rail Sweden AB	Alstom (France)
AP&T	AP&T Sweden Aktiebolag	Osseiran Investment Ltd. (Cyprus)
APC	APC Logistics AB	Nippon Express (Japan)
Astra Zeneca	AstraZeneca AB	Astrazeneca Treasury Ltd. (UK)
Axis Communication	Axis Communications Aktiebolag	Canon Inc (Japan)
Cushman & Wakefield	Cushman & Wakefield Sweden AB	Cushman & Wakefield Plc (USA)
DeLaval (Tianjin) Co., Ltd.	DeLaval International AB	Tetra Laval International S.A. Uid (Switzerland)
Dellner Train Connection Systems (Shanghai) Co., Ltd.	Dellner Couplers Aktiebolag	Daydream Topco S.A.R.L. (Luxembourg)
Diaverum China	Diaverum Sweden AB	Diaverum Holding Sarl (Luxembourg)
Ecolean (Tianjin) Co., Ltd.	Ecolean Aktiebolag	SVEA S.à.r.l (Luxemburg)
EF Education First	EF Education Aktiebolag	Universal Care S.à.r.l (Luxembourg)
Etteplan	Etteplan Sweden AB	Etteplan Oyj (Finland)
Flokk Trading (Shanghai) Co., Ltd	Flokk AB	Flokk Holding AS (Norway)
Frauenthal Gnotec	Frauenthal Gnotec Sweden AB	Frauenthal Holding Ag (Latvia)
Habia Cable	Habia Cable Aktiebolag	Hew-Kabel Holding Gmbh (Germany)
Halton Ventilation (Shanghai) Co., LTD	Halton Aktiebolag	Halton Oy (Finland)
Hastens Limited	Hästens International AB	Hästens Beds International B.V. (The Netherlands)
Hilding Anders (Tianjin) Furniture LLC	Hilding Anders Sweden AB	Hilding Anders Lux Holding S.à.r.l (Luxembourg)
IKEA China	IKEA Industry Älmhult AB	Inter Ikea Holding B.V. (The Netherlands)
iQubator	Scandic Sourcing AB	Scandic Invest Limited (Hong Kong)
Jiangsu Fenix Outdoor	Fenix Outdoor AB	Fenix Outdoor International Ag (Switzerland)
Kitron Electronics Manufacturing (Ningbo) Co. Ltd.	Kitron AB	Kitron ASA (Norway)
Leine&Linde Automation (Shanghai) Co., Ltd	Leine & Linde Aktiebolag	Dr Johannes Heidenhain Gmbh (Germany)
Lindex Commercial (Shanghai) Co., Ltd. Shanghai Production Office	Lindex Sverige AB	Stockmann Oyj Abp (Finland)
Mirka Trading Shanghai Co., Ltd.	Mirka Scandinavia AB	Mirka Ltd. (Finland)
Norautron Suzhou	Norautron AB	Norautron AS (Norway)
Nordea Bank AB, Shanghai Branch	Nordea Hypotek Aktiebolag	Nordea Bank Abp (Finland)

Table 20. continued.

Swedish Chamber of Commerce in China member company	**Associated company in Sweden**	**Group parent company (country of incorporation)**
Nordic Hub China	Scandic Sourcing AB	Scandic Invest Limited (Hong Kong)
Scandic Sourcing	Scandic Sourcing AB	Scandic Invest Limited (Hong Kong)
Orange Cyberdefense	Orange Cyberdefense Sweden AB	Sl Aquisition Bv (The Netherlands).
Oriflame Cosmetics	Oriflame Cosmetics AB	Oriflame Holdings Bv (The Netherlands)
Orkla	Orkla House Care AB	Orkla Asa (Norway)
Polestar Automobile Sales Co., Ltd. Shanghai Branch	Polestar Automotive Sweden AB	Polestar Automotive (Singapore) Pte Ltd.
Purac Environmental System (Beijing) Co., Ltd.	Purac AB	Purac Environmental System (Beijing) Co, Ltd. (China)
Quintus Technologies Co., Ltd.	Quintus Technologies AB	Kobe Steel Ltd. (Japan)
Scan Global Logistics	Scan Global Logistics AB	Scan Global Logistics As (Denmark).
Scandic Foods Asia	Scandic Sourcing AB	Scandic Invest Limited (Hong Kong)
Scania Sales (China) Co., Ltd.	Scania Overseas Aktiebolag	Traton International Sa (Luxembourg)
Snapon [Car-o-liner]	Car-O-Liner Group AB	Sna Europe Holdings Bv (The Netherlands)
Stora Enso China Co., Ltd.	Stora Enso China Holdings AB	Stora Enso Oyj (Finland)
Suzuki Garphyttan Wire (Suzhou) Co., Ltd.	Suzuki Garphyttan AB	Nippon Steel Sg Wire Co Ltd. (Japan)
Talentor China	Talentor Sweden AB	Capus AB (Norway)
Tetra Pak (Beijing) Co., Ltd.	Tetra Pak AB	Tetra Laval International Sa (Switzerland)
Volvo Cars Asia Pacific Head Quarter	Volvo Car AB	Shanghai Geely Zhaoyuan Int Investment Co Ltd. (China)
Wallenius Wilhelmsen Ocean China Ltd.	Wall RO/RO AB	Wallenius Wilhelmsen ASA Group (Norway)
Webpower	Web Power Scandinavia AB	Web Power International Bv (The Netherlands)
WirelessCar (Beijing) Co., Ltd.	WirelessCar Sweden AB	Cariad Estonia As (Estonia)

Sources: Swedish Chamber of Commerce in China, Allabolag

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